

THE  
**SOUTHERN AGRICULTURIST.**

JUNE, 1832.

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**PART I.**

**ORIGINAL CORRESPONDENCE.**

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ART. L.—*On the Construction of Sugar Mills; by THOS. SPALDING.*

" Darien, Georgia, 1832.

*Dear Sir,*—In reply to your letter, and in reply to your correspondent's desire, I will say something in addition to what I have heretofore written, in relation to the construction of sugar mills in Georgia.

Before we introduced the ribbon cane from Jamaica, the common vertical three roller mill, worked by horses, whether made of wood or iron, was all sufficient to express the juice from the common green or Otaheite cane. But this is not the case with the ribbon cane, the same mill, that used to give me, from the green cane, three hundred gallons per hour, gives me but one hundred and twenty; so extremely hard is the rind of this cane; and leaves probably one half the juice behind it. Having seen the operation of the horizontal mills attached to the steam engines in Louisiana, where I was in 1825, I suggested a mill of this kind to be worked by horse power, to my friend, Mr. John H. M'Intosh, of St. Mary's, which he had made at the West-Point Foundry: as far as I know, this was the first horizontal mill ever worked by cattle power: since then many hundreds have been made, but in noting their operations, although efficient to the end, and vastly cheaper

than steam engines, I have been disappointed in the mode of connecting the mill with the moving power, and set, therefore, to work, about two years since, to create a water power, which might be sufficient to propel a mill for ten or twelve hours in the two tides, and which requiring nothing but to raise the gate leading to the race-way, could be attended to as well at night as by day, by the common labourers of the plantation. In order that the tides might not affect these operations, I determined to excavate five acres of marsh, so deep as to secure a foot of water in neap-tides, being quite sure that one foot of water over five acres, would afford a power, equal to the power of a ten-horse engine, for five or six hours of each tide; and this is the highest power that should be applied to a sugar mill. I accomplished my excavation under very great local inconvenience. I placed a water-wheel twenty-four feet in diameter, and with five feet length of bucket. I found, under experience, that letting on my wheel four inches of water, I sunk my pond but ten inches in six hours operation, while I commanded as much power as was necessary. Thus, Sir, even in neap-tides, I had power at command. For, you will remark, that a horizontal mill, the surfaces of whose rollers, move forty feet in the minute, should express five hundred gallons of juice in the hour, or five thousand gallons in ten hours, equal to four acres of good cane; now, Sir, it would require, to cut and prepare, and bring to the mill, four acres of good cane, and afterwards to manufacture into sugar five thousand gallons of juice; one hundred common labourers, a force of great extent in our country, for you will remember, I never thought of making sugar the exclusive crop, either in Georgia or Carolina; and if I was in Louisiana, I would not make it the exclusive crop there; for, mark what I say to you, I doubt if there is a large planter in Louisiana, that in the past year, has paid his expenses, and this must occur so long as sugar is at its present prices.

If five acres of land flooded a foot twice a day is equal upon a water-wheel of the dimensions given to take off the cane that one hundred labourers can bring forward to the mill, it is of course more than sufficient to take off all that any smaller number can prepare and manufacture.

After having prepared my basin and water-wheel, I was anxious to reduce, if possible, the price of horizontal mills,

by seeing if two large rollers could not be substituted in the place of the three smaller; by which means too, the iron frame could have been gotten clear of, which adds much to the cost of the mill. By making two rollers four feet in diameter, the cane in passing through would be as long under pressure in one operation, as it would be in two operations with rollers of two feet diameter. In executing this mill, my workmen, although often admonished upon the occasion, did not allow for the great shrinking of such a mass of wood, and when put together, my rollers were found too small. It was only, therefore, as a matter of necessity, that I had recourse to paper to fill up my rollers. It, however, failed; and I found upon so large a scale, it was impossible to make wood firm enough to meet the pressure which is requisite to express the ribbon cane. Upon a small scale, say as far as fifty acres, the vertical rollers whether of wood or iron, will answer, provided they are short in the space, between the journals; so as to contract the pressure within a limited space by feeding less at a time. Upon a larger scale, and particularly where there is convenience of water, I would recommend a mill arranged in the manner described in the following extract, from my own letter, to the agent of the West-Point Foundry.

“I make these observations, to explain to you, why I have been particularly anxious that a form of machinery should be adopted, which by its simplicity and moderate expense, would give an impulse to the culture of the sugar cane in Georgia and Carolina, even at the present low price of sugar. The only lands in these States that can rival the lands of Louisiana, (I was there in 1825) are the river lands, reclaimed from the water by banking and ditching, and which are now employed in the culture of rice; these lands may be flooded with every tide, and the machinery for cleaning the rice is now propelled by a water-wheel, from twenty to twenty-four feet in diameter, making when in operation from four and five-eighths to five revolutions per minute. Now to attach to the other end of the water-shaft by a coupling box, a sugar mill, (in the event of employing alternately a part of the rice field in the growth of sugar cane,) would be the simplest of all the machines, and I think should be the cheapest. I was aware that the velocity of the surfaces of the rollers would, by a propelling-roller of thirty inches, be a little



‘increased, but this was in some degree necessary, because  
‘these tide-mills work but five hours on a tide, or ten hours  
‘in twenty-four.

“ I preferred arriving at this end by increasing the roller,  
‘to applying spur wheels, because I conceive it is important  
‘in all machines to apply as directly as possibly, the moving  
‘power to the object of its operation, and again, because  
‘however well-formed coggs may be, there is some loss of  
‘power in throwing off motion from one wheel to another.  
‘Still as twenty-six inches would give with my water-wheel  
‘forty feet, instead of the usual thirty feet of the moving sur-  
‘face to the minute, if you can send to me to Darien, a  
‘horizontal mill, with rollers of twenty-six and twenty-two  
‘inches in diamater, completed with coupling boxes, &c. for  
‘twelve hundred and fifty dollars, I would be glad to re-  
‘ceive one from your manufactory, and make the payments  
‘either in Savannah or New-York, as our friends Hall,  
‘Shafter & Co. may determine. I would, however, if the  
‘same to you, still prefer a mill, with the working roller  
‘thirty inches, if the side roller were only twenty; these  
‘proportions would make a more beautiful mill. My first  
‘vertical mill had these proportions, and was the best verti-  
‘cal mill I ever saw, but if from any cause, it be more  
‘difficult to make, why, let it be your own proportions.”

But to return. If, however, there is no convenient water-  
power, a small engine of even four-horse power, (if a con-  
densing engine.) will be sufficient, and with mill and all,  
may now be procured for about three thousand dollars,  
and the engine may be otherwise made useful in the further  
improvements of the manufactory of the sugar. Upon this  
part of the subject I had hoped long since to have been  
able to have communicated something that might have been  
of value, for I have been two years engaged in making  
alterations in my boiling apparatus, but accident after  
accident, the last season, lead to repeated disappointment.  
I shall return to my experiments in a few weeks, I have  
still great hopes of succeeding in simplifying, improving,  
and even cheapening this part of the process.

Wishing your correspondent every possible success in his  
undertaking, I will say, through the medium of your paper  
to him, that he can command my opinion upon any parti-  
cular point, that my experience has afforded me light upon;  
but will draw his attention and your attention to the extra-



ordinary state of the sugar trade at this moment. Sugar is quite as light in weight as either rice or wheat; now, from Mr. Lee's account, fair sugar was bought at Porto Rico, at one dollar and a half per centum; that is at less than one dollar per bushel; wheat, in Virginia, where grown, is worth more by measure. Even in England, foreign sugars in bond, sells at from two to four shillings less than rice in bond. Thus a salt obtained by artificial evaporation from juice expressed from sugar canes, by a costly apparatus, is sold by the purchaser at a lower price than the rough product of the soil in absolute measure. This state of things cannot continue, or sugar will be employed in nourishing a lower grade of animals than man.

Duties on, or duties off, the consumers of sweets will have to pay a higher price for them; it is political oppression that has driven the sugar-grower into this condition of things, and his condition must mend, or he must perish. For myself, I have drawn consolation in the conviction, that the miscreants of Europe and America, who have lent themselves to the persecution of the agriculturists of warm climates, will in their turn, have to pay the penalty, in some proportion, for their follies and their crimes.

Yours, with esteem, &c.

THOMAS SPALDING.

P. S. Since writing the above, I have read in the *Agriculturist*, your correspondent's recommendation of a process, patented two or three years ago in England, to, I think, a Mr. Nowland, and which is described in Porter's book. A bellows is the instrument employed in throwing air into the boiling liquor, than which nothing can be cheaper or more simple. As these bellows are so constructed, that in working them, they give out a continuous stream of air, I conceive a pipe ending in a rose head, like a garden-pot, running to within an inch of the bottom of the kettle, would be the most convenient arrangement. Had I read Porter's book before I had arranged my apparatus for boiling in vacuum, I should have adopted this plan. And if I fail in my present apparatus, I will still adopt it for a bellows with all the necessary fixtures to the last kettle would not cost more than twenty-five dollars.

T. S.

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ART. LI.—*On the Employment of Oxen as substitutes for Horses in Agricultural operations; by JOHN COOPER.*

[Read before the St. Simon's Sporting and Agricultural Society, 16th of March, 1832.]

It is with regret I have to notice, since the establishment of our Society, none of its members have contributed the result of their experience on agricultural subjects. In the hope of this communication being followed by others more useful, I am induced to lay before you some observations on the employment of oxen in place of horses. I am aware that this is no new subject, though one which is much neglected. A steer, fit for the yoke can be bought at the age of three or four years, for ten dollars: the expense of his food, when compared with that of a horse, is trifling; and all the harness requisite for the cart, plough or machine is a yoke and chain. After six years patient and steady labour, the ox can be stall-fed, and made to be worth four times his original cost. Let us look at the horse—his first cost is from sixty to eighty dollars—his feeding is expensive, and his labour not superior to that of the ox; his harness is also expensive, and he is subject in the mean time to many diseases, and, after six years use, is entirely without value.

The experience of many years enables me to say that I have found the ox to answer nearly all the purposes of breaking up land, making up cotton beds, and keeping the corn and cotton clear of weeds and grasses, until the plant becomes too high for the oxen to walk between the rows. I am endeavouring to train single oxen to plough; and if this attempt is successful, of which I have no doubt, I shall find no farther use for horses in farming.

For many years I have kept about ten yoke of oxen, which gin my cotton, break up my corn-land, bed up that for cotton, and partly attend my crops with the cultivator harrow. I have found no difficulty in breaking those oxen—one man manages a yoke, either in the plough or cart; if two yokes are used, a man and boy are required. Having thus given my opinion of those patient and docile animals, I shall proceed to lay down a system for using and stall-feeding a certain proportion annually; and, though it is

difficult to be brief, without at the same time appearing to be dogmatical, I must premise that my observations are founded on actual experience. My directions may appear rather precise, but every person can adopt them to the scale of his own convenience. I cannot, however, too strongly impress the benefit that will result from a systematic adherence to devoting a certain portion of land *to one object*—sufficient is this introduction—my directions are for a cotton plantation with twenty-five or thirty workers.

In the first place, I recommend increasing the working oxen to ten yoke, and until this is done, the operation of my scheme cannot commence. Every year thereafter, break in six or eight young oxen, and stall-feed six of the oldest. My plan of stall-feeding these six oxen, and a few wethers may be annually effected as follows:

Fence in two acres of land—plant the whole with peach, nectarine and apricot trees, at twenty-five feet distance, which will give you one hundred and twenty-eight trees. In December or January plant one quarter of an acre of Irish potatoes; reserve one quarter of an acre for melons—lay off the remaining acre and a half in rows, three feet apart, throw two furrows together, and drill black cow-peas therein in March: your potatoes and peas will be matured by the end of June, and your melon vines ought to be cut up, at latest, by the end of July. As soon as possible after gathering the peas, list in the stalks, continuing three feet beds—chop up the melon vines and unripe melons and list them in likewise. Besides this vegetable matter thus listed in, drill four bushel baskets of well rotted manure into every task row—bed over all, not too high—open a trench, and at every nine or ten inches drop half a dozen of Norfolk turnip and ruta-baga. If you are favoured with rains, the seeds will come up, and the turnip is here subject to no disease. I recommend the proportion planted to be three-fourths of turnip and one-fourth of ruta-baga; the latter ought to be planted early in July—one-third of the turnips ought also to be sowed on the 15th of July, another third on the 1st of August, and the remainder about the middle of the month.

I cannot too strongly urge the necessity of watering the seeds, if the weather is dry where they are sown. By thus dividing the times of sowing, the labour of watering will be found less than might be expected, and, al-



though I have not made the experiment, I think that one man, provided with a garden watering-pot, and being attended by two persons to bring water from a reasonable distance, will go over half an acre a-day. I do not mean a sprinkling, which will only deceive, but a thorough soaking, which, if given when the seed is sown, and twice afterwards at the distance of two days between each watering, will secure the crop in the driest weather. It would be superfluous to give further directions than to replant carefully when required; thin the plants, in due time to one, and keep the ground stirred and clean. When the ruta-baga is six inches high, they can be transplanted with care.

I recommend feeding off the turnips first, agreeably to the time of planting—the ruta-baga may remain until spring as they retain their good qualities even after seeding. I have half an acre of land in an orchard of bearing plumb, apricot and peach trees, at twenty feet distance. The orchard was planted last summer in melons, squashes, &c.—on the 11th and 12th of September it was ploughed, harrowed and lined off at three feet distance; on the lines I drilled about four bushels of rotten manure to every task-row, and sowed with ruta-baga and Norfolk turnips, one half of the ground with each, on the 15th and 16th of September—both too late. My object was to make a fair experiment in fattening a couple of old oxen. About Christmas, I commenced using the turnips. The ruta-baga grew well and regularly, but much inferior in size, being evidently planted two months too late. I could perceive no great injury to the turnips from the trees, indeed I noticed large turnips touching them, and I am sure that they (the trees) are much benefited by the culture amongst them.

I shall now give my plan of stall-feeding:—my first object was to prepare a warm, dry and comfortable house, which, however, from accidental circumstances, was not finished until Christmas. The house is thirty-two feet by sixteen; posts in the ground; lathed with slaps of boards one inch wide, seven inches apart; roof and sides, and both thatched and covered with palmetto leaves. The materials of the house cost ten dollars, besides my labour. A hand thatches as fast as two others can hand him the palmetto leaves. The house was now extremely comfortable; I divided it into four apartments of equal size, with posts, laths left open—each apartment has also a gate or open latched door at the

end, so that there is a free circulation of air. The rooms being sixteen feet by eight, are suited for two oxen in each, although at present only used for one, at the end of these are placed a box four feet square, and eighteen inches deep, on blocks one foot high, for provender; a tub adjoining to hold water, and a small rack for fodder. Thus prepared, I took up two very old and very poor oxen at Christmas, and soon found them fond enough of turnips, of which they *each* eat one hundred pounds weight per day; the turnips being cut up and given to them twice a-day, morning and evening. They received also a bushel basket between them of cow-peas in the haum in the afternoon, (as I ought previously to have mentioned) a peck of cotton-seed with a quart of peas to each, boiled together. They had also unlimited use of rice-straw. The trough or box was carefully cleaned out every morning, and their water-tub emptied, scrubbed and re-filled every other day. They had also abundance of dry litter every other day, when their apartment was cleaned out. If any of their food was left in the morning, less was given next day, if all was eaten, an additional quantity was afforded. Besides those two oxen there were half a dozen of wethers in one of the apartments, which wethers were fed on the same articles. On the 24th of February, I killed one of the oxen, the four quarters of which weighed 708 pounds. The other I mean to keep till April. The one I killed was excellent beef, though I have little doubt that another month would have made it considerable fatter. I have killed two of the wethers—the mutton was good, and particularly juicy. Now those two oxen and six wethers were fed from a quarter of an acre of turnips, from Christmas until the 24th of February, when I killed one of the oxen; the other, together with four sheep continued feeding on the same until the 2d of March, besides leaving three tasks rows for seed. Since then, the other ox, as well as the four remaining sheep, have been fed on the ruta-baga, which will last them until April. It may be well here to mention that I have never yet succeeded in raising Norfolk turnip seed.

Upon the whole, I think that twenty tons of turnips or ruta-baga may fairly be expected from an acre, though my half acre was much more, so much that I fear to mention it. I shall suppose six oxen are put up on 15th of November,

when they will probably be in good order. One may be killed on the 15th of January, and the other four singly at regular intervals of fifteen days: the whole will require sixty thousand pounds of turnips, at the rate of one hundred pounds each per day, for the whole period, which will form an aggregate of five hundred and eighty-five days; and about eighty bushels of peas. This, as nearly as can be calculated, will be the expense of fattening six oxen, worth forty-five dollars a piece.

JOHN COUPER.

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ART. LII.—*An account of an Experiment made on the Culture of the Sweet Potato from Slips or Vines; by*  
A SUBSCRIBER.

*Mr. Editor,*—With the consent of a gentleman, whose successful experience in the various branches of husbandry, has in the appreciation of the writer, imparted a degree of oracular sacredness to his every opinion, I purpose giving you an account of an experiment made by him on the culture of the sweet potato from the slips. The season has arrived when the planter should direct his attention to the preparation of his lands for this most valuable crop—a crop for whose attendance so little labour is required, and whose productions are so munificent. But to return. With the design of putting the efficacy of the means employed in the production of this crop, beyond the reach of any other assignable cause, the soil upon which this experiment was made, was selected, from a field thrown out of cultivation for its utter inability to produce a crop, as most lands situated like the one in allusion are, skirting the brow of a river, whose banks hang in rugged declivities.

The mode of cultivation was succinctly this: previous to the formation of the list, twenty-one cart-loads (mule power) of salt-mud were applied. In this experiment, the mud was drilled, or rather the site of the bed was paved with mud, with the design of obviating the defect incident



to loose soils, as evidenced in the *lengthy* formation of the potato grown on such soils. The listing was then completed, upon which were spread broadcast, seven cart-loads of stable-manure and this was quickly followed by banking—exposure of manure to the action of the sun or atmosphere, being considered a token of an *illegitimate planter*. Seizing upon the first opportunity after a rain in June, his slips were planted, observing great caution in cutting the vines; without which, there is eminent hazard of inflicting serious injury to the root potato, by destroying the fibrous roots which shoot from the vine near the stem of the potato. The vines thus carefully taken were placed three in number lengthwise on the banks, observing that wherever they were connected, an allowance was made for their decay at the ends, by increasing their number or lapping them. The manner of covering the vines was the same as pursued in common with most planters. This piece of land, from its poverty, was never infested with grass, consequently there was no necessity of hoeing. And here it is proper to observe, that a portion of this land received no manure, save the mud beneath the list, and this portion, particularly from the unpromising aspect and sickly size and thinness of the vines, was deemed not worthy of more than one working—(a hauling;) but its production proved as generous as its appearance was niggardly. Where the stable-manure was applied, the product, by actual measurement, was one hundred and fifty-six bushels per quarter acre, and the potatoes uncommonly fine both in size and appearance.

It can scarcely be said that I am more than out of my novitiate in agriculture. Indeed, the fruits of my husbandry would not justify any other conclusion; but human nature like, entertaining a high conceit of my knowledge by a comparison with what I have already determined to be defects in others, and *laughingly eyeing* the management of my neighbours, I pampered myself with the persuasion, that notwithstanding they had a *long start* of me in experience, I was at any rate *up* to them, if not actually *before* them in the art of cropping. At the result of this discovery, I congratulated myself at having thus precociously arrived at a “full stature” in agricultural manhood. And thus, Mr. Editor, would I have remained content—content with making twenty-one bushels of potatoes per quarter acre, because

my neighbours made no more, had not the charm been broken, and I discovered that I have been making comparatively nothing.

A SUBSCRIBER.

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ART. LIII.—*On the joint or last watering of a Rice Crop ;  
by Z.*

“ St. Thomas, April 13th, 1832.

*Dear Sir,*—The cultivation of rice in all its various stages is so important to many of your readers, that no individual will be thought presumptive who adds any thing to the stock of knowledge already accumulated. Having resided near my plantation during the last summer, I had an opportunity of making many observations and some few experiments, the results of which, I shall, if you please, communicate for your journal.

With regard to the sprout-water and long-water, little difference of opinion prevails; the first is used immediately as the rice is planted and remains until it sprouts, the latter is usually put on when the rice has three or four leaves, and according to circumstances, is kept on from twelve to twenty days. After this watering, it is usual to clean the crop thoroughly, and allow it to remain dry until it has jointed: and some planters keep it in this state until the second and even the third joint makes its appearance. It is upon this point that I shall make a few observations, because it is to this improper delay in the use of water, that we owe the disappointments and dissatisfaction that a half filled barn-yard creates, after leaving our crops, clear and apparently thriving in the spring. The joint water (as we term it) is so differently managed by different planters, and each believing his own mode the best, that it is very difficult to ascertain whether its use or abuse affects materially the product of the rice.

As I visited my plantation almost every day, I determined to settle this question for myself, and being free

from all prejudice, I made such an experiment as seemed likely to settle the question. Satisfied with reasonable products, our planters in general have not sought to increase the means, but content themselves with the good old adage of "letting well alone." In some cases the rule is a good one, much mischief is often done by interfering with nature in her efforts, and he is often the best physician who administers a bread-pill or a few drops of cold water, and gives particular directions for their careful and cautious use. My crops have been always fair, considering I was an absentee, yet I was never satisfied that my land (river land) had done all that it was capable of doing. My mode of watering had been at the second joint, but I began, now that I was myself to manage the crop, to reflect upon the wants and habits of rice and other plants. I soon found that analogy would not authorize our delaying the use of water until the rice had jointed. We all know that corn does not suffer most from drought while it is jointing, though it is benefited by showers at this time; it is at the moment that it is about to shoot or form the ear, that rain is absolutely necessary to make a large crop. The same observation applies with equal force to oats, rye, &c.; indeed the oat crop will fail entirely if it has not rain at the time of earing.

These reflections induced me to think that water ought to be applied to rice previous to the joint being formed, or at the precise period when both the ear and joint *were* forming. My speculation I reduced to practice, and I selected three adjoining squares for the experiment. On the first, the water was put as soon as the plant began to enlarge and had assumed that plethoric appearance, which to the practiced eye of the planter evinces that nature is making an effort to complete the process of vegetation, which is to result in fruit. The stimulus of water thus given to the plant seemed to infuse new life into it, the stem or tube in which the ear is formed increased much in size; the colour of the plant became of the darkest green, and in a short time it "shot out (as we term it) a very long ear." The next square was flowed when the first joint made its appearance, and the third square at the appearance of the second joint. The square first flowed continued the best so far as the eye could test it, and that flowed at the first joint was evidently better than the last flowed.



Fearful lest I might be deceived by the appearance, I cut the first line in each square and stacked them alone; these lines as far as I cut contained each three half acres. The produce of these experiments were threshed and measured, and the difference was very great indeed. The first mentioned exceeding the last by ten bushels to the acre; the tailings of neither were threshed over, but thrown into the mass to be threshed and sent to the mill as a separate parcel. This experiment seems to me to settle this question; the same work was bestowed upon each field in cultivating and the same attention in harvest.

I am aware, Mr. Editor, that the method of watering here recommended is not original with me; but next to the inventor of a valuable machine, he is most useful who induces the community to use it. To the experienced planter, I am communicating nothing new, but to the beginner or novice in rice-planting, I feel confident that I am rendering a service. If my communication meets with your approbation, I shall communicate some other facts relative to the culture of rice, which I noticed and noted down during the last summer.

I remain, Mr. Editor, your well wisher, Z.

We shall be very happy to hear from our correspondent often, and we hope he will communicate the facts to which he alludes.—  
*Ed. So. Agr.*

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ART. LIV.—*An Extract of a Report, read before the St. Andrew's Agricultural Society on the 3d of April, 1832, in reply to the Question, "What species of manures and modes of application are best calculated to increase the production of the Cotton Crop?" and ordered, by a Resolution of the same, to be published in the Southern Agriculturist.*

"It is generally conceded that the system of manuring is yet in its infancy; nor need we better evidence of the

fact, than the very unsettled and contrariant opinions we hear so often expressed in relation to its effects, whilst some would most *seriously* question its immediate benefit to the crop, for whose use the application was designed, nay, would even deprecate its tendency; others would build their expectations of a munificent harvest upon the liberality with which it was bestowed. The 'question' assigned us, presupposes it a benefit, when it asks 'what species of manures,' &c. To this almost illimitable query we would reply, that the character of the soil upon which the manure is to be applied, must first be ascertained, its constituent properties defined, and the predominant earth which, from its excess, has rendered the soil unproductive, detected: when this discovery is made, the defect may be obviated by the application of either of the earths of which it may be deficient; by this admixture of earths a texture is imparted to the soil in which the ingredients are so balanced as to yield unitedly their respective advantages, and remedy the defect incident to each\*—for instance, in soils denominated sandy, there is a strong attraction for moisture, but such is its friability, that it parts with it as soon as the action of the sun commences. With a view to obviate this defect and still to retain its capacity for attraction, the application of peat, marle, or salt-mud will be found beneficial. Much of the labour that is now bestowed in enriching our lands may be dispensed with, were we first to ascertain the constituent properties of our soils, in fact it not unfrequently occurs, that stimulating animal or vegetable manures are applied on land already redundant in those very materials, thereby increasing that very excess which already prevails in too great a degree for productiveness.

The character of our lands, with a few exceptions, may be denominated sandy, by which it is understood a soil whose constitution embraces seven-eighths of sand. With the facilities that nature in her wise economy furnishes, with our lands indented with creeks, we would go no further than express our approbation with the practice already in vogue—the use of salt-mud. But as its *use* by an injudicious prodigality has frequently been converted into an *abuse*, we would limit its quantity, in order that we may longer enjoy

\* Davy's Elements of Agricultural Chemistry.

its advantages; for experience, as well as reason, teaches, that to transcend a given quantity, is to render our lands unproductive. Ten cart-loads (mule power) applied beneath the list is enough. We would prefer that the mud be taken direct from its bed, and transported to the destined spot, chopped and spread broad-cast, exposed to the action of the sun and atmosphere a few days, and covered by listing.

The advantages that we claim for this preference are, that whatever escapes from this manure, either in gaseous particles or washings from rain, is imparted to the soil upon which it is designed to act, and not confined to a given spot to which no possible benefit can result, but from the superabundance a lasting injury may be inflicted—that as the chief advantage of mud, is its capacity for retaining water, so as to preserve an uniform temperature and supply of moisture to the roots of the plants, its capacity for aqueous absorption and retention is superior in its unpulverised state. And here without declaring ourselves dissenters from the generally received belief, that ‘mud in a wet season is ruinous to the cotton crop,’ we would ask to be permitted to state the reason why we do not subscribe to that opinion as an agricultural axiom. Most of the ills, incident to the cotton crop in a wet season are derived from resuscitation of vegetable life, or ‘a second growth,’ as it is commonly called. Whenever a second growth ensues, there must previously have been a decline—might not the presence of mud have prevented this, by furnishing the roots of the plants with a regular supply of moisture and thereby render them less liable to be affected by a sudden excess?

After listing is completed, we would call in the assistance of animal and vegetable manure, the scrapings of the barn-yard, or compost prepared in the cow-pen or stable, of which we would advise five ox or seven mule loads per quarter acre. The manure should on no account be suffered to remain exposed longer than a day after it is carted out. It is really humiliating and discreditable to witness the practice of some of our planters, in reference to this subject. Small heaps of manure are arranged with mathematical nicety over the fields, presenting an appearance like a canvass representation of a city, where at night may be seen the curling smoke streaming to heaven. Uncovered these heaps remain for



weeks, as if the planter really apprehended the danger of firing his land by embedding a substance capable of emitting smoke. The manure when applied fresh from the dung-hill and bedded, has not entirely undergone the process of fermentation, the gas, as it becomes disengaged, is taken up by the soil, and its body undiminished, its latent heat breathing, as it were, a genial warmth, assists the seeds in germination, and supports the plant in its infant state; and although (with deference to high authority) we are not advocates for applying unfermented manures on lands that are designed for immediate cultivation, still we would maintain that manure entirely fermented is comparatively inert and destitute of its vital principle; unfermented manures may be best for lands that are not intended for immediate cultivation, but it is evident that to a certain extent fermentation is necessary to prepare the manure as food for plants, and this more particularly when applied above the list.

We do not consider it departing from the limit of our question, to suggest some hints in relation to the preparation of manure. This is a subject of great and interesting importance. It associates in our minds the idea of returning to nature those means of subsistence to which we are debtors, of enriching ourselves from her bounties without impoverishing her stores. It is of importance that care should be observed in the selection of a home-stead or site for a dung-hill, both as it respects the comfort of our cattle, and the security of the manure from waste. The practice is general on this Island of locating our pens on spots environed by dense hedges or trees, with the humane design of protecting our cattle from cold wintry winds. The error in this practice is two-fold. In the first place our cattle fare not much better than if penned on an open plain, for it is not so much the actual cold that injure them as the exposure to rains, snows, &c. In the second place, there is an immense waste of manure, the numberless roots which are invited to the dung-hill in search of food, become so many perennial drains unceasingly flowing from the very centre of the manure heap. A plain shed coarsely built, would secure the advantages of the one and remove the defect of the other. The pen should, in the first place, be paved with a stratum of salt-mud of one foot in thickness, raised a half foot at the edges by increasing the thickness.

By giving it this inclination, the leakings of this manure from above which do not readily become incorporated in the mud, are thrown to the centre of the pen, and are preserved until taken up by the mud. This substratum of mud, when the compost is removed, will be found to be as valuable for its richness as the compost itself. The pen is next littered with pine-straw, gum-leaves, or any vegetable offal, alternately with one and then the other, and if convenient, marine-weeds, sedge-marsh, &c. After every fifth strata of vegetable matter, it would be advisable, both with a view to increase the bulk and to impart savoury richness to the manure, to cover the pen with a fresh stratum of salt-mud. After the dung hill is completed, a covering will be necessary to disallow the escape of gaseous particles, and to prevent entire fermentation, for which purpose we would advise a convex covering of mud, which after awhile will be impregnated with particles of gaseous manure, and like the concave base of the dung-hill, though in a less degree, fitted for manuring purposes. The vegetable materials designed for litter should be gathered in the summer and thrown in heaps contiguous to the home-stead, by being thus heaped, decomposition will have commenced before they are thrown into the pen, consequently the pen may be littered oftener during the winter."

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ART. LV.—*Observations on Several Varieties of Native Grasses*; by THOMAS SPALDING.

" Sapelo, 13th April, 1832.

Dear Sir,—I enclose you three varieties of grass seed, gathered under the different descriptions given of the gama grass. They are all unquestionably valuable grasses, not to be surpassed by any grasses cultivated for hay, in any country.

I number the papers containing the seed, in the order in which in my own mind, and in my own judgment I value them. Number 1, the Gama Luta (not Gama Suta as

printed,) you will find, in all points, agree with the small parcel of Gama Luta seed from Venezuela, which I enclosed you in my former letter, which as Dr. Williamson truly says, greatly resembles the Guinea grass, but it is not the same. It is every way superior: it is more abundant in its stems from the same root, it is more recumbent from its greater weight and succulency. The old roots are all dead, but I found it coming up abundantly from seed where it grew last year, both to day and yesterday. Number 2, is a grass seed I gathered during last summer, while in search of the Gama grass, as directed by one of the letters in your paper. It grows five or six feet high, makes an entire sward, bears its seed close together upon a spike of many inches in length, and the flower of the seed gives a hue of red to the whole spike or head of the grass. The blades are abundant, and would, no doubt, make a valuable hay, although the stem is reedy.

Number 3, is the seed figured in your letter to me, it was late before this verbal description of this particular grass came out in your paper, and although I found no difficulty in my search after it, the seed had generally dropt from the stem. It grows around the margin of my fields, the blades are soft and abundant, but the stem is still more reedy than number 2. Number 2 and number 3 are to-day growing from the old roots, more than one foot high, and would afford a soft and fine food for cattle of every kind.

I will send a parcel of the roots of each, if I can find an opportunity.

Yours, respectfully,

THOMAS SPALDING.

P. S. In my letter, on the subject of the introduction of cotton into Georgia, the printer has made Gen. Porter out of Gen. Proctor, although the printed paper would have shewn that the name was Proctor and not Porter.

Our present arrangements will not permit us to undertake any experiment with these seeds, we have, therefore, left them with Mr. A. E. Miller for distribution, and hope that some of our subscribers will call for, cultivate them, and let us know the result. At any rate, we hope, Mr. Spalding will give us an account of his observations, during the present season.—*Ed. So. Agr.*

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ART. LVI.—*The Successful Planter, or Memoirs of my Uncle Ben; by an EDISTONIAN.*

(Concluded from page 136.)

I have already noticed my Uncle's progressive prosperity, and have carried my reader to that stage of his life, where he took upon him the care of a family. It is not inconsistent with the plan of this memoir, to open to the reader's view, his excellent management in that situation. With this intent, he will excuse me if I skip over several years of my Uncle's life, and introduce him at once into the circle of a growing family.

As it was the will of Providence to bless him with children, he was determined to extend the same care towards them, as that Providence had extended towards him. To furnish them with an excellent education, appeared to him, the best means of bringing about this end. And the principles upon which he built his system, were, like all his plans, judicious and applicable to their respective wants. His own eye, said he, should be their chief instructor. He viewed their tempers and manners as the prime object to be consulted. Books they might learn at any time; but youth was the time to bend the virtue and whole character of the future man. It was at his own domestic fire-side, that these were to be taught; for there, and there in particular, the heart opens itself in affection and is willing to receive those lessons of virtue and religion, which are to carry it pleasantly along through after life.

The scenes of this domestic happiness are before my fancy even now. Methinks I see my Uncle pleasantly seated at his ample supper board, with his young ones around, instructing them in every expression and turning every idle word to some useful lesson of life. Perhaps some friendly guest enjoys his hospitality. If so, his conversation is suitably connected with his profession or trade. His children have been taught to be attentive listeners; and from every word that drops, they gain some instructive hint. How beautiful the picture! how full of all the simplicity of refined human nature. There is life and joy in the scene—there is love and friendship—we can imagine—but cannot describe.



Enjoying this respect at home, it is not to be wondered at, that my Uncle Ben, received a like portion from his neighbours. He soon became what may be correctly termed a *popular man*. No public work could be done without his aid or advice; and he was justly viewed as the chief ruling spirit of the parish. Nor was this estimation falsely bestowed. No! I have never seen the man whose merits more justly deserved it. Whether it was the public work or his own, his diligence was equally evinced. Indeed his superior talents and deep perseverance showed out in his every undertaking. If any work was to be done—if any advice was to be taken, every eye looked to my Uncle Ben; and it was indeed exemplary to mark the politeness and attention with which he received their repeated applications.

The life of the planter, if properly led, is of all others, high-minded, honourable and pure. It appeared, to me, that my Uncle filled up, as much of this picture as human nature would allow. I shall never forget his elegant hospitality. There was none of your affected etiquette about it. There was human nature at the bottom; and human nature too, in its kindest form. In his presence he made every one appear his equal—yet no one could ever feel himself above him. His manners wound themselves into the admiration of all—yet no one could ever say, that he was to *this* man, one thing, and to *that*—another. His was truly a high-minded and elegant politeness. He placed all of the Christian virtues before him, and described his character in one straight forward line, which endeavoured to reach them.

My Uncle was always economical, but never parsimonious. And if I have heretofore exhibited him struggling with hardships, I have now to reverse the picture and present him in the honest and hospitable enjoyment of prosperity. The philosopher is tested by the equanimity of his temper, and he enjoys alike the prosperity or adversity of fortune. It was so with my Uncle Ben. He constantly had his rule before him, and he so laid it out, as to measure exactly the acquirements of his nature. If he knew how to attain prosperity, he also knew how to enjoy it when attained. If formerly his circumstances obliged him to deny many comforts, he now indulged them, because his means would allow it. “Don’t buy your chain,” he used to say, “until

you have measured the depth of your well." "Justice," he used likewise to say, "required the needy man to save his penny—while from the wealthy a liberal shilling was with equal justice required." He was, however, at no time foolishly expensive. He well knew that no folly would be greater, than, to have laboured all his life to become a spendthrift in old age. He frequently laughed at the "maid and her milk pail," and taught his children from that simple fable most of the folly of human life. In every stage of life, his plan was to curtail his expenses—and his usual saying to his children was "to think more of saving than of making." "Take care of the pence," says Poor Richard, "and the pounds will take care of themselves."

My Uncle Ben suffered prosperity to blind him in nothing. Idleness, he considered, the root of all evil; and all about him were taught the full truth of this sacred text. From the day he had inscribed the couplet on the wall, his was a progressive reform. Each day unfolded something new, which he skilfully applied to the necessities which demanded them. Besides his own interest, he well knew, that he must now keep that of his children in view. And as his daily prayer was to "lead them not into temptation; but to deliver them from evil," he was determined, that no example of his, should be to them, a cause of regret. Often have I seen this good man—this true father, rising with the first light of day to teach his children the duties of their future vocations. And that too, not in idle instruction. It was not with him a thing of show—it was practical reality. These were lessons, the importance of which they could not but feel—and the duties of which they were taught to exercise in a proper and becoming manner. It is not strange that those children have since proved the proud and honourable boast of the parish.

There was one duty which my Uncle always held paramount to all others. This was religion. He felt sensibly, that as it was the best means to teach him how to live, so it was the best to teach him how to die. All about him were accordingly taught to feel its gracious influence. And no one ever took more real delight in inculcating its beautiful precepts. He did not, however, view it, as some are wont to do, as a gloomy mystery—as a rite that is to break up our social feelings, and to estrange us from all the enjoyments of this world. On the contrary, he felt that its first

precept taught him "to love his Creator with all his heart, and his neighbour as himself." Viewed in this light, it was to him a subject full of the most pleasurable anticipations. It filled him with that Christian cheerfulness and love, which gained for him the deep affection—if not veneration of all.

It was my Uncle's plan to instruct his slaves in all those duties, which he conceived belonged to them. He placed those of the Christian among the foremost. He accordingly determined to inculcate these as far as his ability would permit. With this intent he had them regularly assembled on Sundays. I shall never forget their appearance on these occasions. All were obliged to present themselves in order, neatly and tidily dressed. He was their only instructor, and if every master were to pursue his plan, I am sure the same success would follow their labours. He spoke to them in suitable language, of those duties which they owed to God—and of those which as honest servants they owed to himself and to one another; and he fully taught them that to fulfil these, was the only way to be happy. "My boys," he used to say, "the eye of the Great Master is over us all. You know when you do any thing wrong something in your hearts puts you to shame and you feel unhappy. And you know too, that when you do your duties rightly, that something tells your heart that you have done well, and you are pleased. Now my boys, this is the spirit of our Father that is within us. It is that spirit which always tells us how to be happy if we will, and how to be miserable if we will. When you have completed your daily tasks—don't you feel that spirit silently pleasing you? And don't you feel happy the whole day? You see then it is an easy thing to be happy—'tis only to be faithful and honest."

I never saw any where a more innocent, a more orderly set of slaves, than Industry-Hall presented. If there is rural felicity to be found any where, it appeared to be with them. Religion had done the right thing with them. It had made them honest and cheerful. Among them was to be found none of those long hypocritical faces, so often seen with the would-be-religious now-a-days—no gloomy looks, wherein villainy is too often concealed, was here. All was gaiety—the gaiety of the innocent and untroubled heart. On a Sunday, how oft have I stopped to view their joyous plays—their games of agility and strength, where-

in it appeared to me, that Providence was so effectually worshipped for his good gifts of health and strength, as if they, innocent souls, had spent the whole day in gloomy meditation. Why religion should ever make us gloomy, why it should ever cloud the bright cheerfulness of man, I could never see!

It was a feature of true wisdom in my Uncle Ben's administration, to have instituted this practice. It must be recollected that it acted with ignorant hearts. They needed direction; and his plan I am certain was the surest to keep them in innocence. It employed their thoughts and suffered them not to run into gloomy aspects of futurity—in such a manner it indeed brought them

“The soul's calm sunshine, and the heartfelt joy.”

Now that I sit alone—and look back upon scenes that I have attempted to picture—the tear comes into my eye, and I could gladly wish to exchange my situation with one of those slaves. To be one of them in innocence of thought and in innocence of action. I have imagined their pure simplicity of life. I have viewed their comparative freedom from care. I have pictured the fond vision to my mind. I could willingly realize its pleasures. But enough—I must relieve the patience of my indulgent reader. I must draw my imperfect sketch to its close. And, however reluctantly, I must come to that final chapter of my Uncle's Memoirs, which must be the end of us all. If, therefore, we have with pleasure viewed the prosperity of the “Successful Planter.” Alas! one has been more successful still!—“he has conquered the mighty and planted his victim in the grave.” Yes, my dear reader, over my Uncle, death has indeed gained the mastery—and where will the parish find another Industry-Hall with another Uncle Ben. 'Tis an easy matter, my dear reader—very easy—“Go thou and do likewise.”

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ART. LVII.—*Horticultural Notices; by the EDITOR,*  
*No. 3.*

Few persons are willing to give publicity to the failure of experiments which they have instituted, under the belief that these failures will be thought to exhibit a want of judgment on their part. It is true, that there are many persons very wise in their own conceit, who always wonder, when the result is known and not before, (we have met with such) that the experimenter could have expected any other, than that which happened. For these sages in agriculture we can gather no information which will be of service: all things are known to them, though for fear the world will become too enlightened, they will communicate nothing, or in such a mystified style as to be unintelligible to common folks. We, therefore, place these aside, as of a different community, and as our task is, to endeavour to gather information for those who believe they have yet much to learn, we will at all times be willing to make known the failure of any experiment which we have made, or which any of our correspondents will communicate; for we believe it is often of as much service to know of the failures in agricultural or horticultural experiments as to know of their success. Both serve to guide us, the one showing us what cannot be successfully done, the other what can, and as we are as yet scarce removed from our noviciate; the knowledge of these aid us materially in our progress. We have in the course of time made many experiments, and have failed, we believe, in more than we succeeded, that is, the results differed from what we expected. We intend overlooking our note book and giving such as can be of any use. Our present object is to notice several, which we have either made in consequence of what we have read and republished in the "*Agriculturist*," or which have some bearing on such.

*Saline Monures.*—In vol. iv. p. 56, of this Journal is a short article recommending the use of salt, and stating, "that plants in a soil prepared with common salt, rarely suffer from the cold and the sudden changes of the weather." When we republished this, we, at first, intended to have accompanied it with some remarks, stating our belief that this was not the fact.

We were deterred by the confident wording of the piece, and feared that we had drawn erroneous conclusions from our experiments. We are now satisfied that saline manures not only does not afford protection to plants from cold, but are actually injurious, in such weather; and in proof of this we will state a few facts, taking the same vegetable, for which it is recommended, and on which it produced such great effect, viz. garden peas.

We have for many years made use of marsh-mud as a manure for our peas, which, from being frequently overflowed by the tides is strongly impregnated with salt.—Under proper management, we have found it an excellent manure, and the peas manured with it productive.

In November, 1824, we had the half of a square manured with mud, and the other half with stable and cowpen manure, and planted the whole with dwarf Marrowfat Peas. In January, 1825, we had very severe weather. Nearly every pea manured with mud was destroyed, whilst those planted on stable and cow-pen manure suffered comparatively but little.

In the winter of 1829, we had several rows manured with swamp-mud, alike number with stable-manure, and the same number with marsh-mud. Many rows on each side were left without manure of any kind. These were planted with dwarf Marrowfat Peas.

In February, 1830, we had some intensely cold weather, so much so, as to destroy the more delicate varieties, such as Frames, Charltons, &c. nearly entirely. The extremities of the vines of the dwarf Marrowfat Peas, were also injured, but none were entirely killed. Those without manure and those manured with swamp mud and from the stable, escaped with but slight injury, whilst those manured with marsh-mud, were so much injured, that the rows on which they were, could be easily distinguished at a distance, and they never recovered, whilst the others bore a good crop. This experiment was repeated the last winter, and with nearly the same results, the only difference has been, that as the peas were not as much injured, they have recovered and are now bearing well.

Thus in every instance in which we have employed salt-mud as a manure, and a severe winter has followed the peas manured with it, so far from being protected, have suffered much more than any others. To what shall we ascribe this.

We certainly think it imputable to the saline particles combined with the mud, which by attracting more moisture around, renders them more liable to injury, and this we think would be the result if salt in an uncombined state was used. That moisture is attracted by it, is easily ascertained by examining ground manured with mud. It will be found damp very often, when that which is not thus treated is quite dry on the surface, and this difference will be more apparent, if alternate rows be used. The mud, of course, must not be buried so deep as to be beyond the influence of the atmosphere, or this will not be perceptible, although it exists. That mud is not injurious when properly applied, we know, having frequently used it not only for this crop, but also for others, and in no instance have we ever known it to afford protection to any vegetable during cold weather.

We had the last winter some young cabbages, a part of which were planted on a square manured with mud, and the remainder on ground manured from the stables; the former were nearly all killed, while not more than about one-third of the latter, and those smallest, were injured.

It will be seen from the above that we are at direct variance with the writer of the article quoted at the commencement of this; still, however, we may be wrong in our conclusions, that saline manures afford no protection to vegetables from cold. No doubt many of our readers, especially those who reside on the islands, have made use of the marsh-mud, and from them we solicit all the information they possess, relative to saline manures, whether it be in favour or against the opinion we have adopted. We wish to correct and not to propagate error, and this can best be done by giving publicity to all facts having a bearing on the subject.

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## PART II.

### SELECTIONS.

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#### ART. XXXII.—*Improvement of Worn Out Lands.*

[FROM THE AMERICAN FARMER.]

First Premium Essay, Agricultural Division. By R. K. Meade, White Post, (Va.)

(Concluded from page 271.)

Here we might stop, and say in reference to the improvement of poor land, go and do as Dr. Ravenel has done, if it did not appear necessary to dwell on some of the particulars which are essentially connected with the ways and means of amassing the greatest quantity of the best compost our materials can afford. The construction of a farm pen then in the first place is a matter of material importance, inasmuch, if an attempt is made to accumulate great quantities of manure in one injudiciously laid off, the health of stock will inevitably be injured; therefore, it should be so constructed as to afford dry shelter and shade at all seasons, with an opportunity of feeding under them; but in addition to this, square covered racks, holding a wagon load of straw each, should be arranged along the centre of the farm pen, and kept full of some kind of rough food all the year round. By this mode of fixture the cattle will be tempted to feed all around them, consequently will be passing to and fro across the materials deposited for decomposition all over the pen. Those who have not tried it, cannot well imagine the quantity of straw eaten by cattle, at the very period too, when the succulence of grass makes it a wholesome corrective to their habits of body. It is as good for them in the summer months, as occasional grazing on rye, &c. would be in the winter when they are principally confined to dry food. But especially when a little brine is sprinkled on it, they take large mouthfuls; the brine that is usually thrown away, the result of an operation which supplies the farmer with that delicious domestic luxury, ice-cream, is sprinkled on the straw at least once a week. They are sometimes so satiated with it as to be regardless of salt at their regular periods of licking it. *Query*—will not this free use of salt pay



well the expense of the ice-cream, the improvement of cattle, and the enriching of the milk and manure? The yard should be large enough to admit of a very gradual slope to the centre, with drains to pass off a sudden overflow of water, and ditched around to secure the sheds against the least interruption from the rain, and if they are kept clean, which is done with but little labour, cattle will soon get into the habit of spending the hours of daily rest there, instead of losing as they do in the woods a *deal* of the finest manure, &c., so important to the decomposition of the dry materials which are from time to time deposited in the yard.

It is a fact worthy of relation, that the sound leaves which are placed a foot thick as the first stratum in the pen, whether in the spring or fall, are in the course of the six months completely decomposed, mixed and worked up by the treading of the cattle, with the corn stalks, straw, &c. as to be one, and indivisible. This composition retains much water in a wet season, which makes it the more necessary to attend to the cleansing of the sheds, not merely for the sake of the cattle, but to make a timely, which is, immediate mixture, of the green dung with the mass of leaves, &c. When the heap of dung is dry the stock will lie upon it, and drop much more of their dung all over it, thereby lessening the labour of clearing the sheds. Although this is not the most perfect system for the improvement of cattle, as it must more or less disfigure and dirty them, and be offensive to their noses, which should be avoided if possible, it is an essential part of that system, where there is a giving and taking, a general and necessary compromising for the common good of the farming establishment—an example perhaps which might be imitated to great advantage in higher places where animals of a superior order should rationally combine in promoting the greatest prosperity of their more extensive farm. But if these cattle were thought too valuable to be thus soiled and turned to some other exclusive object, and not permitted to have ingress to consume the straw, and convert the materials in the farm-pen to good manure, a general injury would be felt throughout the varied interests of the farm for the want of it.

If our politicians by the hundred, men of long experience, extensive learning, and varied acquirements, should find it so difficult to regulate matters to the best advantage on our national farm, as regards giving and taking, why should it be thought so easy, and a matter of course, for a single ordinary individual to bring into harmonious and prosperous connection the varied interests of a smaller farm? Our poor lands, lean purses, and abandoned tenements, reveal the secret, that not only industry and temperance are required, but talents also.

It is believed to be an undoubted truth, that no man has ever yet lived long enough on a tract of land, however extended his

being, diligent his ways, or bright his conceptions, to explore more than a portion of its resources. A well managed farm will of course keep no more stock than can be of good quality; will be regulated by its fertility and production, rather than by its extent. A deal of poor land can raise but little stock, while a small rich one can raise much. The quantity of ground to be ploughed, and all other matters must be done with a due regard to the interests of the whole. A tract of land in the secrets of nature, is capable with the art and assistance of man, of production to a great and certain amount. How are these secrets to be found out? by a fool, a drunkard, an illiterate, or an indolent man? no, rather by the reverse of all these qualities. Henceforth then, let the subject of agriculture be a field for the talents and virtues of many more of our young men; not as formerly, giving it a mere passing glance when they have become tired of other matters, but lend their youth and strength to its support, honour it with their most zealous, first born efforts of genius and affection, and they will receive in return substantial wealth, health, and happiness.

*Manure* But let us again proceed with the diligent collection of materials for the farm-pen, for we are too apt to take advantage of the old saying, that all work and no play will make Jack a dull boy. We have five months, with the exception of frosts in the winter, and exceedingly busy seasons in the summer, to gather materials and scatter them in the farm-pens, at least as fast as they can be properly mixed with the animal manure; and one month, more or less to convey the manure with all possible force to the fields. But farmers say they have not time to cart out their manure after they have made it, and that making, nothing more than casting their stalks and straw, &c. rudely about the yard which has been constructed without convenience or economy, for the cattle to pass over or not, as may be. Yes, they truly indeed have no time, they are too busily engaged in the hard work of destroying their land by much ploughing, without manure or even the aid of grass, and its roots, so valuable a help to fertility.

There is one most important way of adding to the stock of manure, which should never be neglected by a neat farmer, especially as it is killing two birds with one stone. It is going over the whole extent of the cultivated part of your farm, and around every fence, with a horse-cart, and cutting up by the roots all the weeds, and young briars that may have sprung up in the course of the spring and summer, before any of them shall have gone to seed. These green weeds when trodden in with the leaves, which may frequently compose the majority of the great mass of manure, assist much in decomposing them, with their succulence, and, sometimes, acrid qualities. It was said that two birds were killed with one stone, but I discover three or

more; namely: an addition to the stock of manure, the immediate relief of the land, and preventive to their spreading by the seed, a fine growth of grass encouraged in the fence corners, &c. &c.; on the general and particular advantage of leaves as a manure, I will refer you to the essay of last October, in the *American Farmer*.

When in the spring the cattle are turned to grass again, reserve a prudent supply of the best secured straw for summer use in the racks, all the rest should be from time to time scattered over the yards as a fall supply of manure. The winter crop having been previously carried to the corn-fields, &c., and turned under. The fall crop which will be much finer and more completely decomposed, should be harrowed in on a rough ploughed surface, most especially on thin land.

The practice of hauling out straw by wagon loads, to cover land whether with or without grass, is believed to be truly unfarmerlike, especially when covered so thick that the grass is effectually killed, of course the pasture destroyed if the land is bare and very poor, it is a weak and inefficient manure, little more than shade applied when animal manure is required. If this straw was neatly spread on knolls, and cattle penned upon it, there could be no objection, and this is indeed one of the ways of improving poor land worthy of attention. Straw, leaves, or what not, will have the effect of shading more or less the animal manure and urine, while it is making its way into the earth. There is an objection that in very dry seasons a considerable portion of it evaporates, lying thin as it does, while the farm-pen deep with muck retains the greater part. But loose or not, a farmer should always have two or more pens for the same stock of cattle, to insure their comfort and health, as well as to promote the greatest economy in manure making; bringing a portion of it immediately and principally, without the labour of hauling on the point you wish it. Summer cow-pens are then important. He may pay too much for the whistle, even in making manure. It should occupy no more than its due place; therefore crowd not the regular farm-yard with more litter than can be judiciously manufactured. I once injured a fine stock of hogs by going into an excess of an accumulation in their pen. 75 ox-cart loads, equal to 225 horse-cart loads, were made in the course of the year.

Plans should be studied to save labour in every routine of work, but especially in the making of manure. It is then further recommended to select a place most contiguous to your summer fallow for a pen on the following plan. The depth of your soil may in some measure regulate the size of the pen; but at any rate, it must be sufficiently roomy for the number of cattle, say 30 or 40 to half an acre of ground. Virgin earth within, or by the side of a thin wood with the deepest soil should be prefer-

red; ploughed so deep with a bar-share as to raise on the surface an inch or so of clay, provided the soil is not more than 6 or 7 inches deep, then comes a good bed of leaves for the cattle to lie upon, and protect their dung and urine from evaporation; fresh beds of leaves should be applied as often as it is discovered the former ones are trodden to pieces, or the pen uncomfortable for the stock to lie upon; by this process in the course of two months, more or less, there will be a mass of excellent manure formed, some six, eight or nine inches deep, which should then be crossed with a high-beamed bar-share, mixing and lightening the mass as a preparation for hauling it on the contiguous poor grounds. Every half inch of this compound should be sufficient to cover a half acre of land as a top dressing, so that one pen would manure 12, 16, or 18 acres, or the half of it only, if the ground it was put on is known to be so obstinate and greedy as to require it an inch thick.

To have gone very specially into all the useful minutiae which will be discovered by every farmer who has the least observation, and will seriously set about a system of manure making commensurate with his means, would have required a little volume. We will therefore pass on to the other pens, and say that the horse-pen should be well covered from time to time with leaves, &c. &c.—a covered rack in the middle, well stored with hay, and troughs for their other feed judiciously placed. But from dear bought experience it is recommended that horses should never be kept in an open pen at a season when there is a probability of their taking cold by exposure, after having been overheated at any work, for I have reason to believe that some years since I lost several most valuable ones by such exposure in the winter after being overheated in treading out clover seed. But this treading business is by the by, happily superseded by machinery, and a winter's work is now performed in three or four weeks at farthest.

However valuable may be the proceeds of the sheep pen, more than from three to six months' confinement at night cannot be required of them, in reference to their health and general prosperity, in the various climates they inhabit. It would be the worst possible policy to exchange any portion of the soundness and delicacy of their mutton, or the beauty, strength and product of their wool for a few loads of manure, which by other arrangements may be as well made. Whenever the shepherd feels a warm disagreeable miasma, or rather effluvia, arising from the pen, it is time to exercise his discretion in giving them the liberty of the lots and fields, where they will select for themselves a high, dry, agreeable situation.

A propensity to dwell on this subject, reminds us of the propriety of passing on to the hog-pen, as we are engaged in the work of manure making for our poor fields. From hogs pro-



perly managed we get our best manure, taking into consideration the fineness of its manufacture as well as its relative strength, which might perhaps be rather presumptive to pronounce decidedly upon, but it is admirably adapted to a broad-cast, spread by the shovel, at the rate of 15, 20, or 25 ox-cart loads per acre. A solid pavement with sufficient inclination for their dirt to be always working off, to lower ground where the leaves, &c. are deposited, should be constructed with sheds just above it. They should be frequently bedded with fresh leaves to prevent the mange, a disease they are very subject to.

From the barn-yards we now remove to the house and its appurtenances, as a source of much greater improvement to poor land than it has ever been made. It is almost too disgraceful and disagreeable to relate that all the dirt and filth coming from many an establishment, otherwise respectable, is permitted by a careless broad-cast system to "waste its sweetness in the desert air," instead of bringing it carefully together at one point, there to accumulate, putrify, and occasionally be corrected by a covering of lime, until a fit opportunity offers for taking it to the fields to gladden the heart of poor expiring vegetation. There is no calculating the mass of good manure that may be made by the exercise of a uniform discipline where there is a little settlement of houses, as must be expected on a considerable tract of land, in bringing every dust of sweeping to one point; all slop water should either be carried or drained to it; soap-suds which has just been the greatest cleanser, is the worst poison when thrown carelessly at the door. Let this simple question be put to those who have the freest opportunity of making their election between disease and death on the one hand, or life and rural enjoyment on the other—between an enriched grain field, or fine verdant prospect in front, or a dirty, sickly back-yard, with often a poor expiring domestic. Will it not be more agreeable, with early industry, thrift, and attention to perfect cleanliness, to enjoy the one, than by indolence and negligence to endure the other.

The point to which every species of dirt and trash is brought, should be excavated to the depth of a few inches, regulated by the situation of the ground, and surrounded by a stone wall some four or five feet high, and as large as the extent of your materials require. Over one side of which should be a house for the domestics; when on a hill side, drains should be made to it, on the upper side and under the wall—if the grounds are not broken enough to admit of this facility, barrels should be used, one for every house, suspended by an axle through it, one-third of the distance from the top, so as to empty its contents with ease; this axle must play in standers affixed in the main axletree, having block wheels, shafts then push it with ease to any contiguous

point. This fixture which can roll 25 gallons at a time, is valuable to carry slop from the kitchen to the hogs or cows.

One more abundant and convenient source of manure will be mentioned, as there will be no danger of poor land complaining of too much. An experiment has been made by ploughing as deep as well could be, in a rich black soil in a clear place in the woods, a patch of earth, permitting it to be exposed through the summer; in September it was deeply reploughed, and was as light as ashes. Fifteen ox-cart loads of lime, the core of a kiln which had been long saturated with water, was hauled on it, and ten loads of dripped or spent ashes, as our soap-makers term them, and well mixed in the whole mass, which turned out about 100 loads of the mixture, which was hauled immediately on some near thin land and spread at the rate of 25 loads per acre on the rough ploughed clover ground, and harrowed in with the wheat. The exceedingly visible stimulus it produced during the month of October, and early in November, proved that it should have been put on double the quantity of ground, as the ashes and lime were much more powerful in their operation than was anticipated. Here now is a case in point to shew the importance of knowledge and experience, both chemical and practical. Had the experimenter been aware of the strength of his combined materials, he would have spread them over eight or ten acres of ground, instead of four, thereby manuring more than double the ground by the facility of a little head, or book-work.

The various sources of manure are much more abundant than are generally imagined. They are overlooked by excess of cultivation, and through the facility of cutting and clearing more land instead of improving what is already cleared. The writer had anticipated considerable aid in making out these suggestions from a gentleman of a peculiar ability and experience, and well situated to give the most satisfactory advice on the subject, surrounded as he is by poor lands; but improving his own by means and measures, as rapidly as prudence and circumstances permit. Some men have the capital to seize upon a worn out tract, and expend hundreds or thousands of dollars immediately in its recovery; but few would have the knowledge to expend to advantage, because a certain measure of patience is required, however great be the stock of wisdom and wealth. Others must support their families while they are bringing in annually a few rich acres, improving a few more at a greater distance, and gradually preparing the lands at a further remove, for their turn of improvement. Burning the soil with him is one of the sources of fertility; putting every little glade in grass to make hay to be carried on the hills to the stock, instead of tending it in corn to feed the horses while they are ploughing and destroying the upland, and not raising as much as they and their followers consume. Should I receive any thing like a system in detail on the subject, as I

anticipate, it will give me pleasure to forward it to the Farmer pure and unadulterated. The manner in which we still clear our grounds of their timber, as adverse to their progress in fertility, is well worthy of a concluding remark. Some most reputable writer on the subject (I believe Col. J. Taylor,) thinking it of so much importance to have the stumps and large roots come up with the trees, recommends enclosing the ground securely, and cutting away the large roots around the trees and wait for a wind to blow them all up, or down; however, we are informed in the Farmer that brother Jonathan has a stump machine that will clear a piece of land of stumps two feet across with ease; if this be the case, no farmer should hesitate to give a fourth of the price of his land per acre to have it well cleared of these enemies of efficient cultivation. The fire-wood gained would be worth 25 per cent. of the cost of clearing it. If all thought as I do on the subject, some persons might make a handsome business of traveling with machines through the country. If grounds are at all broken, the roots cause the cultivation to be so superficial that most of the soil is washed off before the stumps are half rotted; whereas if the plough in the first place could go a uniform and uninterrupted depth, the soil might be so mixed and managed as to progress in a regular way of improvement, and the ploughs, and harrows, and hoes would be saved many a jirk and bruise. It would be very desirable where only one, two, or half a dozen acres are cleared per year to have it thus managed, it might cost too much in new countries.

Having been engaged for some four or five months with due force in preparations for storing our pens with materials which would otherwise have laid idle, though not always harmlessly, about and about; the time has arrived when much energy is required to undo in one month what has been doing in several. The farmer's mine of gold is to be worked with the greatest expedition and economy. This is too, (spring or fall,) the busy ploughing season, requiring all the efficient horses. Oxen then, and ox-carts at one fourth the cost, must be employed. They carry heavy burthens on a single axletree, and if all be properly managed, two, or four ox-carts, with one or two teams will, with three or six hands, carry out to any reasonable distance their five hundred or a thousand loads, in the month, equal to three thousand horse-cart loads. The facility of raising this manure into well constructed carts with proper implements, is well to be understood. A good hand should always have by his side a light shovel, straight, and crooked fork; with this equipment the load will always be ready for the driver, if he goes to the distance of the fourth of a mile.

Comparisons are odious—they would be truly so, if we could for the sake of demonstration, arrange along side of each other



two farms, the one above described, with a hand on each side of a cart, (with wheels five feet high, four inch broad tire, wide and short body, eight and a half feet, easy to tilt, with convenient sideboards to slip in when necessary,) with forks striking deeply into a bed of manure from one to two feet thick, and occasionally using the shovel to make clean and expeditious work of it. The labourers standing in wooden soled shoes to keep the feet comfortable and avoid colds. A steady and regular going and coming is the consequence; a little greasing every morning, no stalling, or tearing wheels to pieces as with the former narrow ones.

Into the other yard, covered thinly with manure, a four wheeled wagon with or without the body is introduced, drawn by horses, mules, or oxen, as may be, with half a dozen hands to load it, with their medley forks and hoes. The load having been lifted, half the hands proceed to the field with the wagon to assist in the tedious process of unloading, while the others remain to saunter about or scrape up with their hoes the scattering manure for the next load. The narrow wheels cut deeply into the ground freshly ploughed, and retard the operation greatly. This process with the ordinary interruptions where the making of manure is not considered a first rate business, gets out some ten or fifteen loads per day at the farthest, until the crop is removed. Perhaps some farmer will urge that as his manure has cost him so little care, trouble, or labour to make it, that he can afford to misapply some labour in getting it out. We wish such, more correct views of the subject.

Manure should be never put in larger piles than can be scattered well from that point with a shovel or fork, without stepping a yard from the spot. It must be evident from what has been said that the most substantial part of a system of improving poor lands, is to enclose, rest, feel their pulse by the grasses, amass the greatest quantity of fine compost, and apply it near the surface, on a rough ploughing well harrowed in. But our lands have been destroyed by such a variety of means, that a wide field is open to administer to their restoration; and if a generous contribution of talents and practical observation is brought forward to their aid, there is good reason to believe that much may be done by it—the subject in all its bearings is truly inexhaustable.

I have thus, Sir, in a plain way given you a portion of my experience on the subject proposed, without any regular system of arrangement. If the suggestions it offers are worthy of the consideration of our farmers, if the principles and practices are esteemed useful, and may probably even at a remote period, be put into action, I shall be more highly gratified, much better rewarded, than if by a well polished essay, elaborated by much



thinking and reading, it could have succeeded to your honourable premium, which I trust will be annually renewed for the benefit of our agriculture, as long as the American Farmer has a name.

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### XXXIII.—On Planting.

[FROM THE LIBRARY OF USEFUL KNOWLEDGE.]

(Continued from page 263.)

*Modes of transplanting.* Much difference of opinion prevails on the comparative merits of the different methods of planting from time to time introduced, and more or less practised.—Trenching is held by some to be essential to success, without considering that there are situations and soils where timber of the most valuable quality may be produced that cannot be dug or trenched. Others again infer, that to insert seedling plants into the soil in its natural state is all that is required for the production of timber and underwood possessing every requisite value.

These opinions are too exclusive; they have led to baneful effects, and still are the cause why many expensive tracts of land lie waste, which otherwise might have been covered with profitable plantations. But in more numerous instances, from the same cause, great and unnecessary expenses have been incurred, only to result in a total failure of the plantation, with the consequent loss of time and property. Instances illustrative of these points have been too frequent in the management of the forest lands of the Crown, (which ought to shew an example of practical planting worthy of imitation by the community,) as well as on private estates, to require to be cited here. Well regulated economy in the expense, or first outlay, is one of the principles of the art important to be attended to in practice. Accordingly it is not surprising to find some modes of planting invented, and others misapplied, under the mistaken impression of furthering this principle, at the serious risk of retarding the healthy growth and prosperity of the trees, and of producing results completely subversive of the intention.

The great object of transplanting trees from seed-beds layer-stools, cutting grounds, &c. to nursery rows, or beds previous to

their final transplantation for good, is to increase the number of fibres and rootlets; and by ensuring the free uninterrupted formation of healthy stems and buds, to lay the foundation of a vigorous constitution in each individual plant before it be finally transplanted to its timber site.

The different modes of planting trees on their timber sites are denominated, first, slit-planting; second, holing or pitting; third, trench-planting; fourth, furrow-planting. There are also varieties of these characterised by the instruments or tools used for inserting the roots of the plants into the soil.

*Slit* planting is the most simple mode, and is practised on soils in their natural state, without any preparation of holing, ploughing, or trenching. It is performed by three different kinds of instruments: viz. by the *moor planter*, by the diamond dibble, and by the common garden spade.

1st. The *moor planter* is a heavy instrument, consisting of a wooden shaft and handle two feet nine inches in length, terminated by a single slightly curved prong of well tempered iron or steel fifteen inches in length, two and a half inches broad at the insertion of the shaft, and gradually tapering to the point. The handle is made sufficiently large to be grasped by both hands, and the operator with one stroke drives the prong into the ground to the depth required for seedling trees, and by depressing the handle, the point of the instrument raises up the earth, leaving a vacuity or opening in loose earth, into which a person, holding a plant in readiness, places the root, and with the foot fixes in the soil. A stout active workman with this instrument, and the aid of a boy, will transplant a greater number of seedling trees on light moor soils than by any other method at present known.

2d. The *diamond dibble* is recommended by Sang:\* it is made of a triangular shaped plate of steel, furnished with an iron shaft and wooden handle. The sides are each four inches long, and the upper part or inside four inches and a half broad. It is used for planting on sandy and gravelly soils where the surface produce of herbage is short. In this case the planter makes the ground ready with the instrument in one hand, and inserts the plant with the other. He carries the plants in a bag or basket suspended from his waist; he strikes the dibble into the ground in a slanting direction so as to direct the point inwards, and, by drawing the handle towards himself, an opening is made, and kept open by the steel plate for the reception of the roots of the plant by the other hand. The instrument is then removed, and the earth made firm about the roots of the plant by a stroke with the heel of the instrument.

2d. By the *spade*, a cut is made in the turf with the spade and crossed by another at a right angle: the two cuts thus made

\* Planter's Kalendar, p. 178.

resemble the figure of the letter T. The handle of the spade being depressed backwards forces open the edges of the cuts, and in the opening thus made the roots of the plant are inserted; the spade is then withdrawn, and the turf replaced by pressure with the foot.

Sir John Sinclair describes an improved mode of slit-planting, as follows: the operator with his spade makes three cuts, twelve or fifteen inches long, crossing each other in the centre, at an angle of sixty degrees, the whole having the form of a star. He inserts his spade across one of the rays, a few inches from the centre, and on the side next himself; then bending the handle towards himself and almost to the ground, the earth opening in fissures from the centre in the direction of the cuts that had been made, he, at the same instant, inserts his plant at the point where the spade intersected the ray, pushing it forward to the centre, and assisting the roots in rambling through the fissures. He then lets down the earth by removing his spade, having compressed it into a compact state with his heel; the operation is finished by adding a little earth with the grass side down, completely covering the fissures, for the purpose of retaining the moisture at the root, and likewise as a top dressing, which greatly encourages the plant to push fresh roots between the swards.\*

4th. The defects of the slit mode of planting are, that the earth is not properly reduced in its texture to suit the tender fibres of the roots of seedling plants, and the natural plants of the surface are left to contend with them for the nourishment afforded by the soil, nor can the rootlets of the young trees be disposed and placed in their right positions. The least objectionable practice is to cut a circular piece of the turf, a foot in diameter, and lay it on one side with the surface downwards; the workman then with his spade loosens and breaks down the texture of the uncovered soil, and, by making ample space for the extension of the roots of his plant in every direction, inserts it in the pulverized earth. The turf which had been reversed and laid on one side, is then with a stroke of the spade divided into two equal parts, and replaced on each side of the plant in its reversed position. The reversed turf supports the plant against the effects of the wind, retains the proper moisture of the soil, and prevents the evil consequences resulting to the lateral branches of the young tree, and to the healthy progress of the stem, from the uncontrolled growth of the herbage natural to the soil—all of which, by the former modes, are rather encouraged than checked. In uninclosed commons or moors, the natural herbage and shrubby plants are kept under by cattle, &c.; but when such lands are inclosed for planting, and thereby pro-

\* General Report of Scotland, vol. ii. p. 233.

teeted from stock, the natural plants, which before appeared diminutive and slow of growth, suddenly attain a size and vigorous vegetation highly detrimental to the young forest trees.

2. *Mattock* planting is confined chiefly to rocky ground, and to soils containing many coarse, tough roots of herbage, heath, &c.; and under these circumstances the mattock is an indispensable instrument. It is thus described in the Planter's *Kalendar*:—"the handle is three feet six inches long; the mouth is five inches broad, and is made sharp; the length of it to the eye or shaft is sixteen inches, the small end or pick is seventeen inches long. It may be unnecessary to mention that the broad or hoe end should be faced with steel and kept well sharpened; it is perfectly effective in cutting or paring the heath, furze, &c.; and the pick end is equally so for thoroughly loosening and fitting the soil to be operated upon with the spade or planter. The *hackle* prongs are recommended for clayey, tenacious soils,\* which are difficult to work with the spade. It is made with two or three prongs; the former of two for the soil just mentioned, and the latter of three prongs for stoney or gravelly soils.

3. *Holing*.—Holes or pits are dug out, and the loosened soil left for a season to the action of the weather, to ameliorate and reduce its texture. Time should be afforded for the rotting or decomposition of the turf or surface produce taken off the space which is opened, previous to the period of planting. The size of the holes should vary according to the size of the plants to be planted, and to the nature of the subsoil. Plants from one and a half to two feet high should have the holes two feet wide and eighteen inches deep, prepared in the summer or autumn for the reception of the plants in spring. For trees of larger growth, the extent of the roots must determine the size of the holes, making an allowance of from six inches to a foot of extra width beyond the extreme points of the roots. Holes made in tenacious clays retain the water which falls into them, and rots the roots of the trees; dry, light, sandy soils cannot be benefited by the pulverizing action of the sun and air; rocky soils admit but imperfectly of holing; and some kinds of binding gravelly soils are as liable to the retention of moisture as stiff clays. The practice of holing is therefore never attended with success on these kinds of soils.

*Spade* planting applies to land prepared for the reception of the plants by trenching. Although this mode of planting is the most common in use, and may appear to require but little exercise of skill on the part of the operator, it is nevertheless often very badly executed. It is best performed when the holes are made a few inches wider than the roots of the plant extend; the earth of the bottom of the hole should be broken down with the

\* Potney's Profitable Planter.



spade, the sides all round should be made to slope inwards, so as to cause the bottom to be wider than the top. The person who holds the plant should then place it in the centre of the pit, and the operator with the spade should have ready some fine surface soil to cover the bottom and raise it up to the proper height, the person holding the plant raising it at the same time, so that it may stand not deeper in the soil than it previously stood. The earth should then be carefully thrown in a finely divided state, and the plant during the operation slightly moved, so as to prevent the roots from being covered in bundles, and to afford each root and rootlet to have a portion of soil intervening between it and the rest. Treading should be avoided, as it renders the soil cohesive, which in stiff or heavy land is an evil of great magnitude to newly planted roots. In light soils, however, a slight pressure with the foot to keep the plant steady in its place is necessary, particularly if the weather is dry during the season of planting; but in cases where it is practicable, it is much more beneficial to *settle* the earth about the roots of the plants by a free application of water in the usual manner.

It is the best and most expeditious practice to have one set of men to make the holes, and another to finish the planting. When different species of trees are to be mixed in the plantation, and in unequal proportions, each species is successively distributed and planted. What we have already stated respecting the great importance to the success of the plants of not suffering the roots to be dried by exposure to the sun or wind, may render it unnecessary to urge here, that the distribution of the plants on the ground should not be farther in advance than just to keep the planters fully employed. Before laying the plants out on the spots where they are to be planted, it is a most useful practice to dip the roots in water, or in a puddle made of water and rich mould. In planting on a confined scale, the plants may be distributed as before, and two workmen may proceed to open the pits on the spots. As soon as the hole is opened, one of the operators places the roots of the plant in the hole, while the other with his spade finishes the process as above directed. By this method the holes can be made proportionate to the size of the roots of the different plants, which, when of various species, are oftentimes also of different sizes. When circumstances warrant the previous preparation of the soil necessary to this mode of planting, it should be adopted, as being the most perfect and effective.

*Furrow* planting is performed by opening a furrow with the trenching plough, or with two common ploughs; the one succeeding the other in the same trench or furrow, and opening it to the depth required by the roots of the trees. The roots being

placed in the furrow at the proper distances, the workman with the spade finds no difficulty in obtaining the necessary quantity of pulverized soil to complete the work. This mode of planting has been practised with success on the Duke of Bedford's estates in Bedfordshire, and Buckinghamshire in the neighbourhood of Woburn. The implement employed was a very strong plough, drawn by six horses, and opening a furrow from twelve to sixteen inches deep, turning the sward or heath over on each side. This was followed by a scuffer or grubbe of three times, which completely stirred and pulverized the soil. On light land eight acres a day was done in this way, but the soil must be light and free from large stones or other obstructions.

That extensive and valuable plantations have been made by *slit* planting there are abundant proofs, and on elevated, thin, light soils incumbent on rock, or where trenching cannot be effected or the furrow plough be used, this mode may be adopted with economy and success. Before planting by this method, however, it is essential to know the precise nature of the sub-soil, and that there does not exist a hardened stratum, impervious to water, beneath the service, which frequently happens in heaths, or siliceous sandy moor lands, it generally consists of the heath-soil in a compact layer about an inch thick, containing a large proportion of oxide of iron, and impervious to water. Beneath, and next to this, is generally grey or white sand, surcharged with water; and whenever trees are planted, by the slit mode, on soils so constituted, they never make any healthy growth, but perish so soon as the roots reach the hardened stratum: trenching, or the furrow plough must be employed in such cases to destroy the impervious stratum, and render free the circulation of water and air, otherwise the attempt to establish trees will be vain. When the land is clean, friable, moderately deep, free from, and not retentive of stagnant moisture, the mode of planting by holing may be adopted with propriety. Lands of a tenacious, clayey nature, and also those of the best quality, employed for forest planting, ought to be trenched, as being the most economical ultimately, and the most effectual, for these kinds of soil. The preparation of tenacious clayey soils by paring, and burning, and trenching, has already been stated.

Since the above was prepared for the press, we have perused the able tracts\* on planting by W. Withers, Esq., of Holt, in Norfolk. This gentleman, besides shewing, by facts not to be doubted, the superior advantages of trenching, compared to that of holing or slit planting, in the more speedy returns of profits from thinning, and extra annual increase of timber in the trees

\* "A Memoir on the Rearing, &c., of Forest-trees." "A Letter to Sir Walter Scott, Bart. &c." "A Letter to Sir H. Stuart, Bart. &c." By W. Withers, of Holt, Norfolk.

left for that purpose, has likewise proved the value of manure to poor soils in conjunction with this mode of preparation. That such a mode of preparation with the application of manure should be highly advantageous for the growth of the more valuable timber trees on soils of the nature now alluded to, will be instantly seen by every one who has examined carefully the natural habits of these trees by the principles of vegetable physiology already discussed; and such as may feel reluctant, or have not leisure to employ this mode of arriving at a perfect conviction, may be amply convinced by comparing that soil on which the oak, for instance, or any other of the more valuable timber trees, invariably attains the highest perfection, with that on which it or they are always inferior. Compare the constitution of the soil No. 2, with that of the soil No. 5, and the almost total absence of clay, chalk, and vegetable matter, will be evident in the former. Now, on this soil the oak, according to our experience and observation, is never found in a natural state, and, when planted in it, never attains to any value as a timber tree even with the aid, as nurses, of the pine, birch, and sycamore, which here succeed. On the soil, No. 5, where the constituents of the soil are different from those of No. 2, the oak attains to the highest perfection. To supply manure, therefore, composed of clay (burnt or recent, chalk, and vegetable matter, or rotten dung, in the requisite proportions, and by deep trenching (remedying, in some measure, the defects of the sub-soil,) and by combining and comminuting the whole as intimately as possibly, the soil No. 2, would approximate to that of No. 5, and the oak might then be planted with a certainty of its successful produce of this timber. Any smaller application than the requisite quantities of these ingredients will, of course, give a diminished result as to the crop of timber, but still it will give an increase in proportion to the quantity applied.

The principle on which manure is objected to for the rearing of forest trees, is, that it will force the growth of the tree beyond its natural state, and render the deposit of vegetable fibre soft, and of diminished strength and durability. This, however, is carrying the point to an extreme to which it is never likely to be in the power of any planter to arrive, were he even willing to attempt it. To manure a poor soil, for it should be here kept in view that this and not a rich, or even moderately rich soil, is intended, can have but one effect, and that is to improve the growth of the trees. But the great, immediate, and important object of manure here, is to furnish a liberal supply of food while the plant is in its first stages of growth, thereby giving it the means to form a strong constitution, enlarging its number of roots and rootlets, and, at the same time, improving the quality of the exhalations from the soil, for absorption by the leaves, which is, in fact, an amelioration of the local climate or air. All these



important points to the health of the tree, to the value of its timber, and to the attainment of the object in view, a valuable return in the shortest space of time for the capital expended, are thus highly promoted, and, in a great measure, secured by trenching, manuring, and keeping clean of weeds or surface culture for a limited period after planting. As an answer to the important question, will the sum expended in trenching and manuring be returned with interest and profit in proportion to those of the lesser sum required for planting on unprepared land, Mr. Withers has brought forward facts and observations to which we shall revert when discussing the subject of the valuation of timber trees.

The proper distances at which young forest trees should be planted on their timber sites depend on the natural habits of growth of the different species, the nature and preparation of the soil, and the size of the plants to be planted.

The larch, spruce, and pine require less space than the oak, chestnut, elm, &c. The nature of the soil will determine the peculiar species of trees which should predominate in the plantation, and point out the distances at which they should be placed. If the soil is thin and of a light texture, the fir tribe should occupy the largest proportion, if not the whole space of land; if clayey, the oak, elm, ash, &c., should be the principal trees in the design; and, if a deep sandy soil, or if the soil be calcareous, elevated land, the beech, hornbeam, &c., ought to have the preference—all with the view to the ultimate produce of timber. The following table may be useful for readily pointing out the number of trees required for a statute acre of land, when planted at any of the undermentioned distances:—

Distance apart.	No. of Plants.	Distance apart.	No. of Plants.
1 foot.....	43,560	10 feet.....	435
1½ ".....	19,360	11 ".....	360
2 ".....	10,890	12 ".....	302
2½ ".....	6,696	13 ".....	247
3 ".....	4,840	14 ".....	222
3½ ".....	3,556	15 ".....	193
4 ".....	2,722	16 ".....	170
4½ ".....	2,232	17 ".....	150
5 ".....	1,742	18 ".....	134
6 ".....	1,210	19 ".....	122
7 ".....	889	20 ".....	108
8 ".....	680	25 ".....	69
9 ".....	537	30 ".....	49

In profitable forest-tree planting, the nearest distance at which young trees should be planted on their timber sites, is a yard, or three feet, and the widest space five feet; the medium distance of four feet from plant to plant is, or ought to be, that most generally adopted. Seedlings of three years' growth, or plants which have remained two years in the seed-bed and one year in the transplanted nursery rows, should be planted on their timber



sites three feet apart every way, it being understood at the same that the soil is thin, light, or sandy, and that the slit or holing in method of planting is used. But should the soil have been prepared by ploughing and trenching, and be in a clean fallow state, the medium distance of four feet, or three and a half feet, if the species of trees to be planted are exclusively of the fir or pine tribe, will be the most proper. Trees of the age now alluded to will vary in size from nine to twenty inches in height, exclusive of some species of poplar, elm, &c., which grow faster than the generality of forest trees. In well prepared land of a deeper surface soil than the above, plants from eighteen to twenty-four inches in height of the fir tribes may be planted with advantage; and deciduous trees, as the oak, chestnut, elm, &c., from three to four feet in height, may be planted at the distance of five feet apart. In the last case a return of profits from thinnings may be obtained at least two years earlier than from transplanted seedlings, under the like circumstances of the soil. Trees planted as nurses for assisting the progress of those intended for timber are of quick growth, and in the course of from seven to twelve years will have attained to a size fit for the purposes of fencing, or to be used as poles, coopers' ware, &c., according to local demand. When the nurse trees have arrived at this stage of growth, they will require to be partially thinned, to make room for the timber trees, or *principals* of the plantation, as they are termed. Whenever the branches of the former interfere with those of the latter, no time should be lost in remedying the evil, by pruning the nurse trees, or cutting them down. If the different operations of planting have been judiciously performed, the value of the trees thinned out at this period will cover the rent of the land, with compound interest on the capital expended in planting it. Hence the importance of nurse trees, and the propriety of furnishing the ground at first with a sufficient number of young plants to be cut down and taken away periodically, until the principal timber trees have attained to maturity. In poor soils, where the original outlay of capital and the rent of the land are both small, the expenditure will be covered by the periodical crop of thinnings, and *vice versa* in better soils, authorising a larger expenditure in the preparation, in the size of the plants, and in the mode of planting, a comparatively superior number of trees of increased value will be produced at each periodical thinning. These results are certain to follow judicious planting.

(To be continued.)

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ART. XXXIV.—*Ploughing—Additional Remarks.*

[FROM THE AMERICAN FARMER.]

“ The Bryars, N. C. April 20, 1831.

*Dr. Smith*,—Deep ploughing, I have said, enables you to form capacious water-furrows and absorbent beds to hold the water that falls, and to give room and liberty for the crop roots to penetrate and expand themselves. These objects, particularly the last, deserve another moment's consideration.

It is hardly necessary to say that plants feed through their roots, and that these dip, extend and stretch themselves around in search of aliment. Where the soil, by its deep tilth, *admits*, and by its nutriment *invites* their extension, they shew their instinct in sending forth their feeders into every place that promises to gratify their appetites and supply their wants. The roots of the Lombardy poplar, (which tree is a thirsty soul, and a hard drinker,) will find their way to the bottom of a well, sixty feet deep; and corn roots I have seen run several yards, and acquire an unusual size, pursuing the course of a layer of old cornstocks. Under favourable circumstances, roots make a formidable subterranean forest, and it must be well observed, that the parts above the ground, (say the stalk, leaf, grain, &c.) bear a due and certain proportion to the parts below. You cannot expect a good top without a corresponding size and quality of root, nor much root without both the proper nutriment for it to feed upon, and a soil that it can easily penetrate in its search for it—all which I repeat a second time, in order to make, in my poor way, the impression on the understanding and memory, that once saying, if well said, might have effected.

It is said by some that the top will not rise well until the root has ceased to descend, and hence they have contended for a practice as absurd as the assumed facts on which it is founded are false—that cotton, having a tap root, should be planted on a hard unbroken pan to make the roots diverge laterally and prevent their natural descent and form.

In a dry season, a deeply rooted plant finds moisture to support itself, while a surface rooted one perishes; and in a wet season, a deep striking root is not surcharged and drowned, while surface roots die of a repletion of moisture. You may plough a deep soil and work a deep rooted crop in all weather and seasons without injury, and with advantage, while a shallow rooted crop is injured by the cutting of the roots in dry weather, and by the same, and by scalding the stalks in wet. In a shallow soil the land-itself is hurt by ploughing in wet weather, by

being disposed to bake. All the comparative remarks may also be applied to rich and poor soils. As there are soils adapted to all weather, and seasons, and work, we should either make or procure these, or our labour in cultivation will be wofully misapplied, and prove miserably unproductive.

Another advantage of deep ploughing to be mentioned is, that it buries seeds and grass so low that they either entirely perish, or else come up so tardily and late as to permit the crop above them to get the start and keep it. The buried rubbish is a deposit to manure the roots of the plants which no other ploughing or culture should be permitted for that season to disturb. I have often witnessed the comparative effects of deep and shallow ploughing in the preparation for a crop—that while deep ploughing has the advantages I have ascribed to it, shallow ploughing merely uproots and spreads the grass and herbage without burying them; or else it covers them so little as rather to promote their growth. A second ploughing of the like sort, has little more success, and a third may disturb its rest so much as to kill one half, which is left to dry and waste on the sursafe, with harm to the crop, and without benefit to the soil—while the other half remains an active annoyance, as this does a passive nuisance. As to a second ploughing, where the first had been efficient, Jethro Tull, with great propriety calls it *unploughing* the land, because it brings up to the surface and restores to animation enemies that had been safely buried, and whose death and decay would contribute to the life and growth of the crop.

The last advantage, (save one) of deep ploughing that I shall mention is, that high ridges and deep furrows present a greater extent of surface than flat land, and admits the growth of more vegetables.

One other remark I shall make is, that plants may stand close, and will be supported in proportion to the depth of the soil. Depth, therefore, as well as surface is to be considered in seedling for a crop. It is about the same thing whether you have two feet surface, and half a foot deep, or one foot surface, and a foot depth. You have the same quantum of soil in both cases. My neighbours, who are moving to Chickesaw because they have not land enough, would find a plenty at home if they would plough and dig for it. The *terra incognita*, the hidden plantation, is sometimes better than the one which lies in the pangs of death above it.

I will dismiss these desultory and supplemental remarks on deep ploughing with observing, that I took my first lesson on the subject, on the bank of an old ditch, whose thick bed of clay, after due exposure to the air and light, produced a heavy crop of weeds and briars. What I had deemed *dead clay* only wanted a resurrection to become imbued with the powers of life.



A few explanations regarding horizontal ploughing, and I will close a postscript, more prolix and tedious than the Essays to which it is an appendage.

If the meeting of two hills requires a short angle in your furrows, it is better to let them terminate at this point, for if you preserve their continuity you will find the plough to *fall off* at the angle in spite of the best exertions to the contrary; and the consequence will be a ravine.

Never plough the bottom and middle of a hill, leaving a part of its side toward the top uncultivated. The rains falling on this last will run over upon the ploughed ground below in a flood, which no ridges can resist.

After all, a real, bad, steep, difficult hill, that even horizontal ditching and ploughing will not in some reasonable time fertilize, had better be given back to the forest state from which it was improperly wrested, by committing it to briars, plum bushes, or any thing that will save it from waste, and the land below it from the inundation of its sandy torrents.

T. B.

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ART. XXXV.—*Training Cattle.*

[FROM THE NEW-YORK FARMER.]

There is one subject connected with husbandry which is of considerable importance, and which I do not recollect to have seen noticed by any of your correspondents. I mean the best method of training cattle for labour. To be sure, every farmer's boy who is capable of handling a whip or goad, imagines himself competent to break a pair of steers. On this subject I confess myself wholly unable to impart any instruction or advice, having had but very little experience. I have generally purchased my working oxen ready broke, of different persons, and have never bought two pair which were alike with respect to their propensities for work; I have found the difference to vary and range from very good to good for nothing; some have been kind and docile, while others have been timorous, or vicious and stubborn. What is the cause of this wide difference? Has nature established it? Is it to be found in their natural dispositions, or is it the result of education? The latter I am inclined to believe, and the more so from my observations within two weeks.



Having often been unfortunate in purchasing I resolved to train my own, and commenced last week with a pair of steers coming three years old, which from habit had become rather wild. Having had, as I before observed, little or no experience of my own, yet common sense taught me to avoid the practice of some others, who profess to understand the art and mystery of subduing the most stubborn animal almost in an instant; instead, therefore, of confining one of them till the yoke, ring, staple and all are fastened to his neck, and then setting him loose with this frightful appendage rattling and flying about his head, till the poor animal, "frightened out of his wits" and exhausted with running, stops and stands still for his mate to be served in the same way, by which time having recovered his breath, both are again set loose, tied tail to tail, to perform their very interesting and amusing evolutions; they are now half subdued and the whip soon accomplishes the rest, and teaches them to lead a team. Will not cattle managed in this way; frightened, lacerated, abused and provoked, be likely to remember it, and ever after to be timorous or stubborn? Right or wrong, I managed differently. My first care was to make fast a chain to a post, having ready two pair of steady oxen near by. The yoke was then put on the first steer, to which the chain was immediately fastened; he made one or two efforts to get away, but finding them unavailing soon desisted; the other was then yoked, and they were led off quietly between the oxen into the woods; they were used in this manner three days in succession, they were not yoked again for several days on account of bad weather, when I directed my boys to yoke them and put them forward in the team, merely to exercise them; this was done then and several times since without the least difficulty—they have neither deserved nor received a stroke of the whip to hurt them.

I am confident that our domestic animals may be so taught, as to make the inhuman and abusive use of the lash, so often witnessed, altogether unnecessary. Is not this a subject worthy of the pen of some one of your humane correspondents, whose practical knowledge enables him minutely to point out the proper course to obtain the desired result?

JOHN TOWNSEND.

*Andover, Con. Feb. 18, 1832.*

ART. XXXV.—*On the Mulberry Tree, Silk Worms, &c.*

Translated from the French for the *Genesee Farmer*, from a work entitled  
"The Practical Course of Agriculture."

(Continued from page 275)

*The food of silk-worms, and the different periods of casting their skins.*—The worms require attention according to their age: as soon as they are out of the shell they seek food. It is

necessary to give them those leaves only which are proper for their age: young worms cannot eat leaves which are too old; and those more advanced find a too weak nourishment in a leaf just beginning to open, and would consume four times as many as they would of those which are proper for them.

The quantity of leaves which should be given to the worms should be proportioned to their number and appetite, which may be ascertained at their time of feeding: if the leaves of the former meal are entirely consumed, and nothing remains but the fragments, the quantity should be increased at the next; on the contrary, if a part is left untouched, less must be put. The main point is not to let the worms fast, taking care, however, that more leaves are not consumed than are necessary.

The leaves should not be gathered before the sun has dissipated the morning dew: those gathered when it rains, and given to worms when still wet, are very hurtful to them. If, however, the intemperature of the weather is such that the leaves must needs be gathered when wet, they should be dried by spreading them on cloths in an airy garret, or some other dry place, without heaping them, and taking care to stir them from time to time, in order to prevent their heating.

Leaves gathered in good condition, that is to say, free from rain or dew, and without having been left to heat, after having been collected together on a cloth, they should be removed to a cool place, in the shade, in order to preserve them only for the space of twenty-four hours, at least when a rain or storm had been anticipated, and it had been necessary to lay in a double quantity of food; in that case care should be taken that the leaves are heaped, and the beds should not be more than two or three inches thick.

Silk-worms, like other caterpillars, cast their skins four times before they make their cocoons: all these castings are sorts of diseases by which great numbers perish. When the worms are about to cast their skins, their appetite increases during twenty-four hours before the first casting; it lasts thirty-six hours at the second, forty-eight at the third, and sixty at the last. At these different periods they should be fed four times a day, and at each time the quantity of leaves should be increased: this attention causes the worms to fill better, and gives them strength to cast their skins.

Too great heat fatigues the worms during the time of casting: the most favourable temperature is that of eighteen degrees, or twenty at the utmost. A casting is known to be good, when the worms move briskly, when lightly blown upon after they have finished their casting: when they devour the leaf with avidity, and are uniform in thickness and length.

The most exact cleanliness should be observed in the spinning place: no matter which can rot or purify, no fragments of leaves, no dry excrements, no dead or dying worm, should be left there.

The worms should be often removed from the litter formed by the fragments of leaves, and by their excrements; this is necessary both for the salubrity of the air, and for the health of the insects; the most simple method is, that when fresh leaves have been given to the worms, and they have crawled upon them, to take the leaves by the stems, and place them on other hurdles, that those on which they were before may be cleaned. Where they are well attended to, the litter is removed once or twice, as it may be necessary, from one casting to another, during the two first ages. From the end of the first casting to the end of the second, the worms require by degrees the same attention; but as they take up little room, they may be kept in a small space: but after the third casting they must be put in other hurdles or boxes, and should be equalized, by putting together those which have cast their skins at the same time. The extent of their shelves should be in proportion to the number of worms: those which are produced from one ounce of seed should consequently occupy a space of sixty feet; when they have attained their full growth, and the more space they occupy, the better they prosper.

From the end of the third casting to the end of the fourth, the worms require great cleanliness; because eating much they make much excrement: at this casting they are from twenty to twenty-two lines in length: their heads are large, and their bodies thick-set; they have a light flesh coloured tinge, but after two or three days their colour becomes clearer, when they are about to enter the great *freze* or *briffe*, which is an extraordinary appetite. Then the quantity of food should be more abundant, and given every four hours.

The third casting has always been considered the most dangerous for silk-worms, and that in which they are subject to the most diseases; then their food should be taken from the oldest mulberries. When they have passed the fourth and last casting, they have arrived at that period of their life in which they take up the most room, and when they eat the most; their appetite increases above all after the three first days; their hunger and avidity is unparalleled, and always in proportion to the degree of heat which is given them. This hunger continues during six or eight days: then the worms begin to spin their cocoons.

It is not at all necessary to try to shorten this period by an augmentation of heat, because the cocoons would be thin and poorly furnished with silk; the worms would not be fed long enough, in this state, to prepare in a proper manner the soft gum which they draw from their food. When the worms have passed through the fourth casting, they should be cleaned often, and the purest air possible should be given them, without exposing them to a current of air so cool as to kill them.

(To be continued.)

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## ART. XXXVI.—On Poultry Yards.

[FROM THE NEW-ENGLAND FARMER ]

*Mr. Fessenden*,—Allow me to make a few remarks upon poultry yards. Poultry are very profitable incumbents of a farm, but not unless considerable care is devoted to them, for if left to take care of themselves, they are the most vagrant and vexatious creatures living. Now I say, the art of keeping them to advantage consists in having for them a proper and convenient yard. In the first place it should have a pleasant southern aspect; they will not thrive in a severe exposure, for if it is placed as it frequently is, on the north side of a barn or in some cold situation, that it may not occupy a choice spot or be in the way, the poultry suffer, do not thrive, and when let out for recreation, will not return. In our severe winters, hens are sometimes frozen, and as the most profitable kind (a mixture of a small and the large English) are somewhat delicate, from not being quite hardened to our climate, care should be taken that the yard be in a warm situation, which they so much prefer, that they will lay, thrive and flourish, sufficient to repay the expense of the situation.

Next, a poultry yard should be in a dry situation, and for the simple reason that a damp and wet place is also generally cold, and fowls are fond of light and fresh air. But I would observe, that they should always have clean and fresh water, by which a much greater number of eggs will be produced, and the fowls themselves be in better condition for eating.

Next, the yard should be large; well and *high* fenced, of course. The size must depend upon the discretion of the raiser; I should say, the larger the better; it would depend upon the quantity of space to spare, and the number kept. If it is large, it will admit of many conveniences which could not be afforded in a small yard—for instance, a part should be supplied with gravel, lime from old bricks, rubbish of that kind and clean shells, which fowls convert to their use. A part should be occasionally turned over with the spade, a few minutes labour, and which furnishes much food; there might be a few bushes or shrubs planted in a part, as fowls are fond, in a sultry day, of reposing in their shade, and the many insects creeping about them, serve for a ready food—all this would not require much space, though the more the better. I would say concerning the poultry house, which should open upon the yard, that the principal thing to be attended to is, that it be kept as *clean* as possible; or the hens will wander, if possible, and prefer the sweet scented hay-mow for their purposes. There is a double profit in keeping the house clean, at the fowls not only thrive better, lay a greater number of eggs easy to be got, but the contents when swept out, are the most useful of garden manure. The poultry house, if in a conspicuous situation, might be of a fanciful and tasteful form.

These remarks are the result of some experience, and are suggested on the consideration of the high price of eggs in the market, generally, and more especially the past winter, and of the high price of fowls, when well raised and well cooked. W.



## PART III.

### MISCELLANEOUS INTELLIGENCE.

The following Gentlemen were elected Officers of the *St. Andrew's Agricultural and Police Association*, at their meeting on the 3d of April last, viz :

JOHN B. GIRARDEAU, *President*.

DR. R. LEBBY, *Recording Secretary and Treasurer*.

DR. JAMES F. PERONNEAU, *Corresponding Secretary*.

*Agricultural Committee*—John Rivers, J. J. Mikell, John E. Rivers.

*Police Committee*—John B. Minott, Edward Freer, William S. Godber, Croskeys Royall.

*Stewards*—James T. W. Holmes, Virgil Maxey.

Rawlins Rivers, to deliver the next Annual Address.

*Vegetation of Brazil.*—The most numerous natural order of plants in Brazil, (that is, from the tropic of Capricorn to the equinoctial Line, the northern limit of my travels,) is the *Compositæ*. Then follow the *Gramineæ*, *Rubiaceæ*, *Malvaceæ*, *Melastomaceæ*, *Myrtaceæ*, *Leguminosæ*, *Orchideæ*, *Terebinthaceæ*, *Euphorbiaceæ*, *Cyperoidæ*, *Aroidæ*, *Malpighiaceæ*, *Acanthaceæ*, *Rignoniacæ*, *Convolvulaceæ*, *Apocynæ*, *Scrophularinæ*, *Solanaceæ*, *Scitamineæ*, *Guttiferæ*, *Bromeliaceæ*, *Urticeæ*, *Salicariæ*, *Annonaceæ*, *Tiliaceæ*, &c. These, though mentioned rather at random, will give you an idea of the botany of my Brazilian journey. It is remarkable, that I scarcely found a single representative of the order *Crucifereæ*. You have from all quarters heard the most animated descriptions of the luxuriance and richness of the vegetation of Brazil, and with them I warmly agree. But this is become almost a fashion; and, in Europe, it seems the general opinion, that the *whole* of that country is clothed with the most magnificent forests, and of gigantic growth. This idea, though correct with respect to all the maritime districts, the courses of the rivers, and the greater part of the country lying under the equinoctial line, is, however, not at all applicable to vast tracts in the provinces of San Paulo and Goyaz. There I have traversed boundless plains, or open regions, some of them covered with fine pasture, formed by a vast variety of the most interesting *Gramineæ*; others with grasses intermingled with small plants and shrubs of the fine leaved *Melastomaceæ*, the *Malpighiaceæ*, the herbaceous *Rubiaceæ*, and *Compositæ*; others with a varied clothing of annual and perennial flowers, (almost disappearing during the dry season,) faintly shaded or protected by extensive groves of low trees, of singular or stunted growth, rarely growing so close together as to form a thicket, or impede the traveller. These arid groves have sometimes reminded me of the acacia groves, so predominant over the plains in the interior of Southern Africa. Yet it is rarely that one can compare African with Brazilian botany; their character in many particulars differs so widely; but I was a long time in Brazil before I saw such large trunks of timber as I have observed in some of the forests of the Cape colony. I allude to the *Podocarpi*. These forests are indeed of no extent, compared to those of America; but they afford specimens of sylvan scenery for the pain-

ter, not less grand and beautiful; although they are generally deficient in that most splendid and noble feature, the palms. When, however, we descend towards the low latitudes of Brazil, the glorious magnificence of the forests is truly astonishing, and none but those who are born in the midst of them can view such imposing productions of nature without a feeling of awe or respect. She overloads herself, and one object oppresses and smothers another in the general struggle for luxuriance. The *Bertholletia*, and some species of *Bombax*, far overtop their vegetable brethren, and the trunks of the latter are really stupendous, both in height and thickness. I say nothing of the great climbing plants, as they have been lately so often described; but we never can be silent with respect to the palms; they abound in every latitude and situation, and their variety is far greater than any one traveller can form an idea of. They are of every size, from that of an ordinary herbaceous plant to that of the highest tree of the forest; but I think none surpass the Buriti or Miriti (*Mauritia vinifera*, Mart. t. 38,) in grandeur and imposing beauty. Another plant of most extraordinary aspect and magnificence, is the *Araucaria*; but this I never saw much to the northward of San Paulo. It is only found at a great elevation and, I believe, is not known to exist in the provinces of Goyaz and Para. I have found but few *Bardacena*; but the *Velloxia*, their nearest relations, cover whole plains, in different latitudes in the interior; never in the forests. They give a singular and strange character to the landscape, not to be represented but by the pencil; they resemble some *Dracena*. The *Melastomaceae* are found elsewhere, and in every situation. The *Vochysiaceae* are numerous, and many are most beautiful flowering trees, and afford excellent timber. They also afford various localities, as likewise do the *Myrtaceae*. The *Laurineae* are numerous, particularly to the southward; but in Para are species producing the finest cinnamon, and a kind of nutmeg is also found there.—*Arcana of Science*.

*The Palm of Chile.*—It is chiefly in the middle province that the palm of Chile (*Micrococcus*) is found. It is not a common tree, being very partially distributed, but several of the estates owe much of their value to the number of palms upon them; and, although the stem is useless, the leaves, sap, and fruit, yield a large income to the proprietor. For thatching houses, the leaves are considered better and more durable than any other material; the sap, boiled down to a syrup, is used as a substitute for honey, and has a very agreeable flavour; and the small cocoa-nuts, about an inch in diameter, of which every tree produces a great number, are highly esteemed, and form a considerable article of export to Peru. A curious method is employed to free the nut from the green husk in which it is enveloped, a process that was formerly attended with a great loss of time and labour. A number of cows and oxen are driven into the enclosure, where a quantity of the fruit is spread, and being very fond of its husk, they immediately begin to feed on the fruit, only slightly masticating it in the first instance, and swallowing the whole: afterwards, while chewing the cud, the nuts are rejected; and when the meal is finished a heap of them is found before each of the animals, perfectly free from the husk, the cattle being thus supplied with food at a season when little grass remains on the hills, at the same time that they effectually perform a very useful operation.—*Ibid*.

*Native Country of Maize, or Indian Corn.*—This grain, so important to the agricultural interest of the United States, appears to be of uncertain origin. Fuchs very early maintained that it came from the east; and Mathioli affirmed that it was from America. Regnier and Gregory have presented fresh arguments in favour of its eastern origin. Among them is the name by which it has been long known in Europe. *Blé de Turquie*; and varieties, it is said, have been brought from the Isle France, or from China. Moreau de Jonnés, on the contrary, has recently maintained, in a memoir read before the Academy of Sciences, that its origin was in America. The name *Blé de Turquie* no more proves it to be of Turkish origin, than the name of the Italian Poplar

proves that the tree grew wild in Italy. It can only signify that it spread from Turkey into the neighbouring countries. Its general cultivation in southern Europe, and the production of some new varieties, proves nothing with regard to the country of the species. In favour of its American origin, is the fact that it was found in a state of cultivation, in every place where the first navigators landed. In Mexico according to Hernandez, and in Brazil according to Zeri; and that in the various countries it had proper names, such as *Maize*, *Flaolli*, &c.; while, in the Old World, its names were either all of American origin, or names of the neighbouring region, whence it was immediately derived; and that, immediately after the discovery of America, it spread rapidly in the Old World, and soon became common, a fact not reconcilable with the idea of its former existence there. To these proofs Aug. de Saint Hilaire has added another. He has received from M. de Larranhaga of Monte Video, a new variety of maize, distinguished by the name of *Tunicata*; because instead of having the grains naked, they are entirely covered by the glumes. This variety is from Paraguay, where it is cultivated by the Guaycurus Indians, a people in the lowest scale of civilization, and where, according to the direct testimony of one of them, it grows in the humid forests as a native production.—*Arcana of Science*.

*Sterility of Hybrid Plants*.—On the 9th of May, M. Dutrochet addressed a letter to the Academy of Sciences of Paris, in which he attributes the sterility of hybrid plants to the imperfection of their sexual organs. In the flowers of some species of cherry-trees (those derived from the union of the *prunus cerasus* and the *prunus arium*), the stamini have no pollen; their antheræ form a compact mass which does not divide into pollenic or fertile dust, as is the case with fruitful cherry-trees.—*Ibid*.

*Radishes*.—There is a radish growing at Perth [Van Diemen's land] in a shoemaker's garden (reserved for seed) as thick as a stout man's thigh, and from 10 to 11 feet high: in fact the radish appears to take a different character in the deep and moist sands of Perth.—*Hobart Town Courier*.

*Cow Cabbage*.—At a meeting of the Sterlingshire Horticultural Society, a Tree or Cow Cabbage, 5 feet high and 18 feet in circumference was exhibited. "This giant succulent being stationed on the terrace of the adjoining Bowling Green, and surrounded by the enormous competing Savoy's and German greens, formed a most imposing group."

*The Vine*.—A writer on the cultivation of the *Vine* in Sidney, states that blight after the fruit is set, may be prevented by ringing the old wood, which sustains the young branch.—*Gard. Mag*.

*Barking the Stems of Fruit Trees*.—A writer for the Gardner's Magazine says, in substance, that his gardner in Holland, at the winter pruning, given in that country in February, cuts off with his common pruning-knife all the outer bark, down to the liber, of his apple and pear trees, and vines, above eight or ten years old; not so deeply, however, with the young as with the old trees. This man's practice is said to have been always successful in producing larger and better flavoured fruit, than can be obtained without that process.—*Amer. Farmer*.

*To Boil Potatoes*.—Being almost half sick from the changeable weather, I, the other day, retreated to the kitchen corner—a comfortable place when the cook is good natured. She was a new comer, a native of Wales. The potatoes were peeled and put into the water after it had commenced boiling. After they were about sufficiently boiled, the water was poured off, and the saucepan containing them, again put on coals to drive off the moisture. Two or three times in the course of ten minutes, she took off the lid, and shook up the

potatoes, bringing those at the bottom to the top. In this last operation consists the whole art of boiling a potato. The steam is allowed to escape from all the potatoes, and from all parts of the sauce-pan. If a towel is put over the potatoes, while they are steaming, it absorbs the moisture that condenses on the under side of the lid and drops again on the potatoes. When the lid is taken off to shake up the potatoes, the towel is also taken out. Potatoes managed in this manner, are superior beyond all comparison to those cooked in the common way.—*N. Y. Farmer.*

*Illinois Butter.*—The editor of the *Illinois Advocate* complains bitterly of the quality of the butter brought to Edwardsville, (Il.); even high prices, it appears, have no effect in producing it of good quality. The cause is rather a curious one, and we will let him speak for himself. "If high prices would be of any effect here, cause of complaint would have long since been removed. But the cause is innate in the makers, and in consequence good butter is as rare in this market as pine apples in Iceland. *Ecce signum.*—A few days since we purchased a few pounds (Hobson's choice,) and although the morning was cool, and the butter had been put up in nice rolls, we were obliged to lift it out of the vessel in which it had been brought, by *spoonfuls*. What a pity that hogs are so much easier raised in this country than cows, and that in consequence, *lard* is so cheap as to make it profitable to mix it in butter in the proportion of at least *one half*. Greasy doing these.

*Dead Animals.*—Good meat and drink are not more necessary to health and good living, than good air. You may as well take noxious substances into your stomach as into your lungs. You will therefore please to omit a practice of some, who are more properly *cumberers* than cultivators of the soil, who hang dead lambs, cats, &c. on fruit trees, or expose them about their premises, to generate poisonous and pestilential effluvia. Rather than suffer such nuisances to annoy and deile your homestead and neighbourhood, you should cover all dead animals with five or six times their weight of earth, (if mixed with about a sixth part of quick lime the better,) and the whole mass in process of time, will become excellent manure.—*N. E. Far.*

*Cleanliness and Comfort as regards Animals.*—Cleanliness is favourable to health, by promoting perspiration and circulation. Animals in a wild state, attend to this part of their economy themselves; but in proportion as they are cultivated, or brought under the control of man, this becomes out of their power; and to insure their subserviency to his wishes, man must supply by art, this, as well as other parts of culture. Combing and brushing stall-fed cattle and cows, is known to contribute materially to their health; though washing sheep with a view of cleaning the wool, often has a contrary effect from the length of time the wool requires to dry. This often brings on cold, and aggravates the liver complaint so incident to those animals.—*Ibid.*

*To Promote the Growth of Trees.*—Some separate the dry bark of fruit and forest trees to promote their growth, and prevent the bark *binding* so much. This disfigures the tree, making seams in the trunk, and makes it grow in angles. The best way is, when the sap is forced up, by warmth of spring, to scrape off all the scaly particles of dead bark, and wash the trees repeatedly during the week with soap suds, &c. Trees of considerable age will then have a youthful appearance; be more thrifty, and in the case of fruit trees, the fruit will make more cider, than that grown on scurvy, moss grown trees.

Put cinders, bones, stones, about the roots of pear trees; it will increase their growth one-third, and save them from the blight.

\*S.

*Genesee Farmer.*

*Feeding Cattle.*—When there is a white frost on the grass, keep your cattle in the yard, and give a little dry fodder. When the frost is melted off, then turn them out and they will do well.

\*S.—*Ibid.*